AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

S. HRG. 112–519

IMPROVING FORENSIC SCIENCE IN THE CRIMINAL JUSTICE SYSTEM

HEARING

BEFORE THE

COMMITTEE ON THE JUDICIARY
UNITED STATES SENATE

ONE HUNDRED TWELFTH CONGRESS

SECOND SESSION

JULY 18, 2012

Serial No. J–112–86

Printed for the use of the Committee on the Judiciary

U.S. GOVERNMENT PRINTING OFFICE
75–711 WASHINGTON : 2012

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2104 Mail: Stop IDCC, Washington, DC 20402–0001

COMMITTEE ON THE JUDICIARY

PATRICK J. LEAHY, Vermont, *Chairman*

HERB KOHL, Wisconsin
DIANNE FEINSTEIN, California
CHUCK SCHUMER, New York
DICK DURBIN, Illinois
SHELDON WHITEHOUSE, Rhode Island
AMY KLOBUCHAR, Minnesota
AL FRANKEN, Minnesota
CHRISTOPHER A. COONS, Delaware
RICHARD BLUMENTHAL, Connecticut

CHUCK GRASSLEY, Iowa
ORRIN G. HATCH, Utah
JON KYL, Arizona
JEFF SESSIONS, Alabama
LINDSEY GRAHAM, South Carolina
JOHN CORNYN, Texas
MICHAEL S. LEE, Utah
TOM COBURN, Oklahoma

Bruce A. Cohen, *Chief Counsel and Staff Director*
Kolan Davis, *Republican Chief Counsel and Staff Director*

CONTENTS

STATEMENTS OF COMMITTEE MEMBERS

Page
Grassley, Hon. Chuck, a U.S. Senator from the State of Iowa 3
Leahy, Hon. Patrick J., a U.S. Senator from the State of Vermont 1
prepared statement 98

WITNESSES

Burns, Scott, Executive Director, National District Attorneys Association, Alexandria, Virginia 12
Neufeld, Peter, Co-Director, The Innocence Project, New York, New York 10
Spriggs, Jill, Crime Lab Director, State of California and President, American Society of Crime Lab Directors, on behalf of the Consortium of Forensic Science Organizations 8
Stoiloff, Stephanie, Commander Forensic Services Bureau, Miami-Dade Police Department, Miami, Florida on behalf of the International Association of Chiefs of Police 5

QUESTIONS AND ANSWERS

Responses of Scott Burns to questions submitted by Senators Franken and Klobuchar 23
Responses of Peter Neufeld to questions submitted by Senators Franken, Grassley and Klobuchar 27
Responses of Jill Spriggs to questions submitted by Senators Franken, Klobuchar and Grassley 42
Responses of Stephanie Stoiloff to questions submitted by Senators Franken, Grassley and Klobuchar 62

SUBMISSIONS FOR THE RECORD

Burns, Scott, Executive Director, National District Attorneys Association, Alexandria, Virginia, statement 93
Matson, Barry, Deputy Director, Alabama District Attorneys Association, ADAA Office of Prosecution Services, OPS, statement 100
Neufeld, Peter, Co-Director, The Innocence Project, New York, New York, statement 109
Spriggs, Jill, Crime Lab Director, State of California and President, American Society of Crime Lab Directors, on behalf of the Consortium of Forensic Science Organizations 117
Stoiloff, Stephanie, Commander, Forensic Services Bureau, Miami-Dade Police Department, Miami, Florida on behalf of the International Association of Chiefs of Police, statement 121

ADDITIONAL SUBMISSIONS FOR THE RECORD

Submissions for the record not printed due to voluminous nature, previously printed by an agency of the Federal Government, or other criteria determined by the Committee, list.

Spriggs, Jill:
http://www.swgfast.org and http://www.ncjrs.gov
Stoiloff, Stephanie
Joint ATF and SWGGUN Annotated Bibliography, http://www.afte.org

IMPROVING FORENSIC SCIENCE IN THE CRIMINAL JUSTICE SYSTEM

WEDNESDAY, JULY 18, 2012

U.S. Senate,
Committee on the Judiciary,
Washington, DC.

The Committee met, pursuant to notice, at 10:10 a.m., in room SD–226, Dirksen Senate Office Building, Hon. Patrick J. Leahy, Chairman of the Committee, presiding.

Present: Senators Leahy, Franken, Blumenthal, and Grassley.

OPENING STATEMENT OF HON. PATRICK J. LEAHY, A U.S. SENATOR FROM THE STATE OF VERMONT

Chairman Leahy. Although Senator Grassley is here, he had to step back out for a minute, so we can start. I will continue on and then, of course, yield to Senator Grassley when he comes in.

We are going to reconsider the important issue of how best to ensure the effectiveness and scientific integrity of forensic evidence used in criminal cases. Of course, it is essential to make sure the criminal justice system works for all Americans, for the defense and prosecution.

Now, this is an issue that we have had as a priority in this Committee for years. It was an issue that formed a backdrop for the Committee's work on the Innocence Protection Act and the Justice for All Act in the last decade, and we focused again on it in the last 3 years.

The National Academy of Sciences published a report in February 2009 asserting that the field of forensic science has significant problems that urgently need to be addressed. I did not then and do not now view the Academy's report as the final word on this issue but, rather, as a starting point for a searching review of the state of forensic science in the country.

In the past several years, we have seen a continuing stream of exonerations of people convicted of serious crimes, some because of mistakes of counsel, but also some, too many, because of flawed forensic evidence. Kirk Odom, imprisoned in Washington, D.C., for 20 years for a rape he did not commit based on faulty hair analysis, is just one recent, tragic example. Twenty years. Just last week, the Justice Department announced a sweeping review of thousands of cases to determine whether defendants were wrongly convicted based on flawed forensic evidence by the FBI lab in the 1980s and 1990s. It has long been clear that action is necessary to ensure improved support for forensic science and meaningful national standards.

The Judiciary Committee's process began even before the National Academy of Sciences report. The Committee held two hearings in 2009. We have conducted numerous meetings over the years with those on all sides of the issue—law enforcement, prosecutors, defense attorneys, forensic scientists, academic scientists, and many, many others.

In 2011, I introduced the Criminal Justice and Forensic Science Reform Act—comprehensive legislation designed to build greater certainty and reliability into forensic science nationwide. The outreach continues after the introduction of the legislation. I have asked for feedback from all sides to try to find a consensus solution.

One thing that has become very clear, though, is that, for all the serious problems that have been found and questions that have been raised, forensic practitioners are doing great work every day. I remember using many of them when I was a prosecutor. Laboratories and practitioners around the country follow sound procedures. They strive to be fair and accurate and produce vital evidence. I say that because I think it is important to recognize the good work that is done by so many, as well as to point out the significant gaps. We need a solution that builds on existing strengths, identifies weaknesses, and fills in those gaps.

Strengthening forensic science is not something that tips the scale to one side or the other in the justice system. Forensic disciplines that have been proven to be reliable and that create total confidence will help law enforcement and prosecutors to identify and convict those guilty of serious crimes. But doubts about the reliability of some forensic analysis have led to successful challenges in court. Basically—and I want to put most of my statement in the record—it comes down to this. We want the accurate science. Forensic science is not designed to help one side or the other. It is designed just to be accurate and give the truth. If it exonerates people, then that is the right thing to do. If it convicts people because it is accurate, again, the right thing to do. The worst thing that can happen in society is if we convict the innocent or fail to convict the guilty. Let us have it accurate so that both sides when they come in can look at it and say, OK, the one piece of evidence we can be sure of is this forensic science. It benefits all sides.

Now we are going to hear from a police lab commander, a State lab director, a prosecutor, and a founder of the Innocence Project. They are not going to agree on all of the details about how best to move forward, but I hope they will agree that action is necessary and, more to the point, will agree on many of the principles that should guide a legislative solution.

I think there is widespread acknowledgment that every forensic laboratory nationwide should be accredited under recognized national standards and that forensic practitioners should be certified in their field based on appropriate training, education, and ability. That also means we have to dedicate resources to basic foundational research.

Finally, there is a shared understanding that the forensic science community needs Federal support for capacity building, training, and development. We know the importance of harnessing the expertise of those here. The Justice Department is well positioned to play this central role, but agencies like the National Institute of Standards and Technology and the National Science Foundation can help.

So I have tried to bring all these thoughts into it, but the most important thing is I want consensus on a program that will allow, when a piece of forensic evidence goes in, that everybody, defense and prosecution alike, knows what the standards are and knows what they have before them.

I will put my full statement in the record.

[The prepared statement of Chairman Leahy appears as a submission for the record.]

Chairman LEAHY. As I mentioned, Senator Grassley got here actually ahead of me. He is with us, and, Chuck, do you want to go ahead?

STATEMENT OF HON. CHUCK GRASSLEY, A U.S. SENATOR FROM THE STATE OF IOWA

Senator GRASSLEY. Yes, I would like to make a statement. First of all, thank you. This is a very important hearing, and I join you in wanting to make sure that the forensic science system is as good as it can be. This is an important subject for our Committee since forensic science is the application of science in the courtroom, designed to identify the guilt and exclude the innocent. It is not about academic or pure scientific research. And I am pleased that we are able to have a consensus panel today.

Years ago, I supported a whistleblower who exposed serious problems at the FBI crime lab, Dr. Frederic Whitehurst——

Chairman LEAHY. Dr. Whitehurst is here.

Senator GRASSLEY [continuing]. And he is here in the room today, as you just said. Dr. Whitehurst risked his career to come forward with allegations about wrongdoing at the FBI crime lab. In the words of the Federal District Court for D.C., "Dr. Whitehurst has made a number of very serious challenges that call into question the scientific integrity of the FBI crime lab and the thousands of prosecutions that rely on evidence it has processed."

For his efforts, he was retaliated against by the FBI and spent years litigating with the FBI via the Freedom of Information Act trying to obtain documents outlining the retaliation that he faced. The disclosures Dr. Whitehurst made resulted in the Department of Justice IG investigation that recommended 40 changes to improve procedures at the lab, including accreditation by an outside body. Thanks to the actions of Dr. Whitehurst, cases where faulty procedures, flawed analysis, and improper testimony had been given were reviewed. Ultimately, Dr. Whitehurst's case resulted in the Justice Department creating a regulatory process for whistleblowers to adjudicate their claims. That process is, unfortunately, broken and needs legislative correction.

Additionally, more work needs to be done on the FBI crime lab and the Department of Justice review of past cases. Recently, the Washington Post found that a 2004 Justice Department review of flawed hair and fiber analysis at the FBI lab did not go far enough in identifying potential cases of wrongful convictions. And even in cases that were identified, Justice did not ensure that defense counsels were informed. So as a result, I joined you, Mr. Chairman, in a letter to the FBI on this matter, but almost 60 days later, we have not received a response.

The FBI publicly announced last week that it was expanding its review, but our request for basic information still has not been answered. So on Monday, I sent another letter with further questions. I expect answers to this serious matter to ensure that the problems Dr. Whitehurst uncovered are not continuing to this day.

So I appreciate the importance of this hearing and the goal of improving the use of forensic science in the criminal justice system. Wrongful convictions are very rare, but they do happen, and flawed use of forensic science accounts for some of it.

I want to be clear that I do not think forensic science as a whole is a problem. Forensic science has come a long way over the years. Most important was the development of DNA testing. Nowadays we do not even need outdated forensic discipline like hair comparison or blood matching, which accounts for most of the wrongful convictions due to flawed use of forensic science. Furthermore, the cases are usually the result of bad practice of forensic science, not the science itself.

Unfortunately, there are those who claim that certain forensic sciences as a whole are invalid. These critics usually point to one famous case or another to indict the entire discipline. Example: After more than 100 years of critical contributions to public science, fingerprints are now called into question because of Brandon Mayfield's incident. The Washington Post yesterday said that there is "uncertainty" with fingerprints as a whole. This latest attack is similar to the attacks which questioned whether DNA analysis was valid when prosecutors first tried to introduce that in the early 1990s.

However, there is plenty of proof on the record that fingerprints are reliable. One study completed after the Mayfield incident found a 99.9-percent reliability by FBI examiners. And this study was published in the peer-reviewed Proceedings of the National Academy of Sciences. That is why, as the Justice IG has pointed out, every Federal court of appeals that has addressed the issue has held that fingerprints are admissible as evidence.

The criminal justice system is adversarial for a reason. Why? To help uncover the truth through questioning of evidence. It is a robust system with constitutional and other legal protections.

Unlike the adversarial system, some have recommended that we turn over forensic study to the unelected and, often, unaccountable bureaucrats.

From my work in the Senate with Federal Government whistleblowers, I can tell you that I would trust the adversarial court system before I trusted the Federal bureaucracy. What happens in a courtroom is public and claims are subject to cross-examination. Decisions about forensic science should not be made behind closed doors by people unelected in the bureaucracy.

We have all seen how a supposedly neutral scientific regulatory agency, the FDA, handles honest disagreements. They do it, as I stated yesterday on the floor of the Senate, by spying on dissenters. I would hate for decisions on forensic science to fall prey to that bureaucracy as well.

There are three main issues, therefore, that I want to examine:

First, how do we improve forensic science without throwing out the baby with the bath water? I do not want our efforts to improve the system to call into question the hard work that has already been done—or is being done every day—in the labs across the country.

Second, what kind of improvements will be most efficient and effective? Should the Federal Government, which has some of its own problems—be regulating the States? Or should it get its own house in order first?

And, last, how will any changes relate to existing policies and procedures? There is already a lot work going on to improve forensics. The DOJ-supported Scientific Working Groups for each discipline are crafting new standards for their members. Justice and other entities are funding more research. Labs are being accredited to strict national and international standards. And prosecutors, defense counsels, and judges are learning more about how to evaluate forensic evidence. Congress should be careful not to preempt all of that work. Thank you.

Chairman LEAHY. Thank you very much.

Our first witness will be Stephanie Stoiloff, senior police commander of the Forensic Services Bureau at the Miami-Dade Police Department. Head of the lab, she oversees forensic labs and tests controlled substances, trace evidence, biological evidence, firearms, tool marks, and so on. She is a nationally recognized leader in forensic science. She is also the co-chair of the International Association of Chiefs of Police Forensic Science Committee. She is here on behalf of the IACP. She has lectured before the American Prosecutors Research Institute, the National Institute of Justice, teaches forensic biology, and she received her Bachelor's of Science from the University of Florida, her Master's from Florida International University.

I apologize for the voice. The allergies seem to pop up as soon as it gets above 100 degrees in Washington.

Ms. Stoiloff, please go ahead.

STATEMENT OF STEPHANIE STOILOFF, COMMANDER, FORENSIC SERVICES BUREAU, MIAMI-DADE POLICE DEPARTMENT, MIAMI, FLORIDA, ON BEHALF OF THE INTERNATIONAL ASSOCIATION OF CHIEFS OF POLICE

Ms. STOILOFF. Thank you. Good morning, Mr. Chairman and Senator. My name is Stephanie Stoiloff. I serve as the commander of the Forensic Services Bureau for the Miami-Dade Police Department in Miami, Florida. I also serve as the co-chair of the Forensic Science Committee of the International Association of Chiefs of Police. I am here today on behalf of the IACP, representing over 22,000 law enforcement executives in over 100 countries throughout the world. In the United States, there are over 18,000 State, local and tribal law enforcement agencies with over 800,000 law enforcement officers. I am pleased to be here this morning to discuss the challenges currently confronting the forensic science community within the United States and the need for further resources and support of forensic science within the law enforcement community.

In February 2009, the National Academy of Sciences issued a report entitled, "Strengthening Forensic Science in the United States: A Path Forward." In January 2011, legislation was proposed to address some of the topics discussed in this report. The IACP, the Major Cities Chiefs Association, and the Association of State Criminal Investigative Agencies each have Forensic Committees comprised of law enforcement executives, laboratory directors, and private sector representatives from across the Nation. The three Forensic Committees, as well as members of the National Sheriff's Association, have jointly discussed some concerns with the proposed legislation. Collectively, law enforcement appreciates that Senator Leahy and his staff recognize that the collaborative efforts of all stakeholders are a critical component of this legislation. This collaboration has been a positive process that has enabled the concerns of the State and local agencies to be heard.

Over the past 30 years, the forensic science community has voluntarily established internationally recognized laboratory accreditation and professional certification programs. Law enforcement agencies have made considerable financial investments to support this voluntary accreditation, a program defined by the implementation and maintenance of rigorous quality assurance standards, in over 400 crime laboratories nationwide.

The importance of forensic science to the investigation of a crime has police chiefs nationwide asking how we can better use these forensic resources and, further, how do we ensure scientific integrity?

Forensic science is not the floundering profession that some may portray it to be. As with any scientific discipline, there is a perpetual need for support, improvement, and advancement. In fact, many of the improvements in forensic science have resulted from the commitment of law enforcement agencies and their executive leadership to sound forensic practices. Although many collaborations have been developed to address the recommendations brought forth in the NAS report, there are still several important concerns that need to be addressed.

The first—and greatest—need is funding. The forensic community needs funding to perform the work conducted nationwide every day. The common question asked is: How much funding is needed? One billion dollars was allocated to address DNA backlogs. That is, $1 billion was allocated for one discipline alone that still is not able to completely manage the flood of evidence submitted for analysis. Have we now put a price on public safety? One billion dollars per forensic discipline would not be enough to address the need for accreditation, certification, research, education, and analysis. The forensic community itself requested the NAS report to be written to address the resource needs of forensic service providers. We know what the problem is. The question is: What is going to be done about it?

The second need is leadership. The forensic community needs strong national leadership with the understanding that one size does not fit all. The needs of Federal, State, and local agencies are separate and distinct from each other. Our agencies and their forensic laboratories are at ground zero in the fight on crime. Most of these organizations have higher demands for service and fewer resources available with which to wage that fight as compared to the larger State and Federal laboratories.

Our agencies agree that all forensic service providers including stand-alone forensic units such as latent prints and crime scene units should follow quality standards and attain accreditation. Further, our agencies also agree that each forensic scientist must demonstrate competency in their discipline. Our law enforcement executives have the ultimate responsibility to ensure accurate and efficient delivery of forensic services. Strong national leadership can provide a comprehensive plan to incrementally introduce and implement the funding and other resources necessary to fulfill these goals.

Third, more higher education programs and internships in forensic science should be established to assist the forensic science community. While forensic science has attracted nationwide attention, little funding has been funneled into higher education for forensic scientists. A common misperception is that forensic science is not a science. By definition, forensic science is the application of scientific knowledge and methodology to legal problems and criminal investigations. By its very nature, science is about new testing, new technology, and new applications of technology. How can we do what we do every day and do it better? New advances occur every day within universities nationwide. Forensic science research programs and educational opportunities support the investigations conducted daily by public safety agencies to protect its citizens and make its communities safer.

In closing, Federal, State, tribal, and local law enforcement are utilizing every possible resource to provide public safety. The law enforcement community appreciates the opportunity to work with Senator Leahy and his staff to develop a workable solution that supports the needs of the forensic science community. These comprehensive discussions have covered all aspects of forensic science, including the incredible advances that have been realized in the recent past, the limitations of many historical procedures, opportunities for continued advancement, and the differences between theory, pop fiction, and real forensic evidence. It is our hope that these open discussions will continue, allowing everyone to accomplish the goal of providing the framework and resources necessary to maintain our existing capabilities and develop new technologies for the future.

[The prepared statement of Ms. Stoiloff appears as a submission for the record.]

Chairman LEAHY. Well, thank you, and I appreciate your willingness to continue working with me and with my staff because we do want something that is going to work for all involved. And I think you point out the difficulties—we know what we have to do, but now we have to determine the steps we have to take to get there.

Our next witness, Jill Spriggs, is the chief of Bureau of Forensic Services at the California Department of Justice. As the head of the bureau, she oversees 13 regional crime laboratories, the fourth largest DNA data bank in the world, specializes in DNA analysis, and has more than 23 years of professional experience in forensic science. She is here today representing the Consortium of Forensic

Science Organizations. She is an officer of that consortium. She works with the California Department of Justice's Advance Training Center. She teaches and consults on cold cases. She is also president of the American Society of Crime Lab Directors and the treasurer of the California Association of Crime Lab Directors.

Ms. Spriggs, we are delighted to have you here. Please go ahead.

STATEMENT OF JILL SPRIGGS, CRIME LAB DIRECTOR, STATE OF CALIFORNIA, AND PRESIDENT, AMERICAN SOCIETY OF CRIME LAB DIRECTORS, ON BEHALF OF THE CONSORTIUM OF FORENSIC SCIENCE ORGANIZATIONS

Ms. SPRIGGS. Mr. Chairman and Members of the committee, thank you for giving me the opportunity to testify before you today about forensic advancement. I am Jill Spriggs, the crime laboratory director for the State of California and the president of the American Society of Crime Lab Directors. However, I am here today representing the Consortium of Forensic Science Organizations and speaking on behalf of the over 12,000 forensic service providers that our organization represents.

I would first like to express my appreciation for your tackling of the daunting task of writing this legislation, which is very important to our community, as well as for the process you have created in drafting this legislation. You and your staff have been most extraordinarily open and collaborative. It has been a process that we greatly appreciate. We have been impressed by your office's desire to listen and learn from the actual practitioners in the complex field of forensic science. You and your staff have truly understood that the application of the science is quite different from what may be written in a textbook or on TV, and we look forward to a continued productive dialogue.

We have long since recognized that while our Nation's crime laboratories and medical examiner offices are State and local entities, our science has no borders and it crosses into numerous jurisdictions. Continuity of processes is very important. In 1994, Congress passed the DNA Identification Act to provide Federal guidance to standards that would allow for the advancement and expanded use of DNA technology in order to utilize this groundbreaking technology in the most productive manner to the Nation's criminal justice system. The Federal Government then took the leadership role in creating technical working groups consisting of Federal, State, and local forensic scientists, international members, academia, and independent consultants. One of the most visible groups is the Scientific Working Group on DNA Analysis Methods, or SWGDAM. The role of this group is to ensure the uniformity of DNA standards and improve processes within the forensic human DNA laboratory community.

Each discipline in forensic science also has a similar SWG group. However, these other disciplines have not enjoyed the widespread Federal support as the DNA analysis Scientific Working Group. Yet they comprise over 90 percent of the work conducted in our Nation's lab system. The Nation's crime lab and medical examiner systems need to be viewed and addressed as a single system that encompasses all disciplines.

At the core of our issue is the ability of the system to be flexible and responsive. Our Nation's crime laboratories must have the capacity to process all the evidence that comes into the laboratories in a timely manner and with the utmost in quality and accuracy. This applies to all 13 disciplines. In fact, while DNA is the most popular in the media, our largest backlog and casework is, in fact, controlled substances. Many of our crime labs are drowning in synthetic drug cases. This is a perfect example of why we need Federal guidance and leadership.

All labs and State legislatures are experiencing similar issues with identifying drugs to schedule, then be able to place these substances into their respective codes, have the crime labs in a position to analyze them, only to have the uncontrolled analogs to these drugs produced and distributed in a very efficient manner to circumvent the new legislation.

We support the accreditation for all public and private crime labs and believe they should operate in accordance with ISO 17025 and other relevant ISO standards. We agree that these standards should evolve and advance as the science does and are encouraged by the discussions that we have had with your office regarding the continued utilization of these standards as we move forward versus starting over with federally established standards.

A natural progression from the quality systems of the organization—in other words, accreditation—is the competency of the individual, or certification. We are supportive of an organized Federal role in enhancing the breadth of proficiency testing, but again do not believe that the process should begin from scratch.

A National Research Strategy for comprehensive and targeted research of forensic science also must be pursued. It is critical, however, that there is input from the active practitioners in the field to ensure that the research is applicable to and necessary for the casework currently handled by crime labs and medical examiners.

Also key to continued advancement of our science is a group of rigorous forensic science education programs both at the undergraduate and graduate levels. The well-established Forensic Education Program Accreditation Commission, or FEPAC, has for some time been credentialing these programs and does not need to be reinvented.

Another key element of forensic science is that of death investigation. At present, roughly half of the country is utilizing a system of untrained or minimally trained lay coroners lacking requisite forensic training. The other half uses highly trained and certified forensic pathologist physicians functioning as medical examiners. This must be resolved so that the death investigation and all death investigation is equal.

Finally, grants for forensic science must stem from the requirements of the community providing grants, and a process must be developed to ensure that grant funding matches the need.

Mr. Chairman and members of the Committee, there is much precedent in other countries for guidance and assistance for forensic science, such as Australia and New Zealand where the National Institute of Forensic Science provides guidelines and coordination among the forensic science providers in those countries. In fact, it operates on a staff of six at the Federal level. We are supportive of a model similar to this which will provide the much needed leadership, guidance, and experience to ensure the continuation of a quality system. Crime laboratories serve the public at large and the criminal justice system. In order to do this effectively, there must be an open line of communication between all parties in which quality forensic science comes first.

Again, thank you for all that you have done, and we look forward to the continued discussion so as to achieve the much needed Federal leadership that we require in the field of forensics. Thank you.

[The prepared statement of Ms. Spriggs appears as a submission for the record.]

Chairman LEAHY. Well, thank you very much. What I am going to do is have each witness testify and then ask questions.

Our next witness is Peter Neufeld, who is no stranger to this Committee. He has testified here before. He co- founded and co-directs the Innocence Project, an independent, nonprofit organization affiliated with the Benjamin Cardozo School of Law. He is a partner in the law firm of Neufeld, Scheck & Brustin. For the last 12 years, he has served on the New York State Commission of Forensic Science. He has co-authored a number of books, influential books on the use of forensic evidence in criminal cases. Prior to his work with the Innocence Project, he taught trial advocacy at Fordham University Law School, a staff attorney at the Legal Aid Society of New York.

Mr. Neufeld, please go ahead, and thank you for being here.

STATEMENT OF PETER NEUFELD, CO-DIRECTOR, THE INNOCENCE PROJECT, NEW YORK, NEW YORK

Mr. NEUFELD. Thank you, Chairman Leahy, and thank you, Senator Grassley, for inviting me. As you mentioned, I am the cofounder and co-director of the Innocence Project. We have special gratitude, obviously, for Senator Leahy, who for the last decade or more has been the staunchest advocate of wrongful conviction reform, not because simply he is concerned with the civil rights of the wrongly convicted, but also as a prosecutor he is aware personally how important it is to strengthen these disciplines as a matter of public safety.

I also wish to introduce to the Committee right now two men who were wrongly convicted who were just exonerated in the past week. They are here with their very persevering and tenacious lawyer, Sandra Levick, from the Public Defender Service here in the District of Columbia. Both men are local D.C. residents.

Kirk Odom, who is right behind me, was arrested in 1981 at age 18 for a rape he did not commit. He has been exonerated through DNA quite recently.

Santae Tribble, who is on the other side of Ms. Levick, was arrested at age 17 and convicted for a 1978 murder which he did not commit, only to be exonerated recently through DNA testing.

Both of these innocent men were denied their youth, their families, their careers, and their liberty for far too long. Indeed, it took each man more than 30 years to prove their actual innocence. But I produce Mr. Tribble and Mr. Odom today because they have particular resonance for the issues before this Committee.

In both cases, microscopic hair evidence was analyzed by the FBI crime lab here in Washington. The trace unit of the FBI crime laboratory handled hair microscopy. In both cases, two different forensic examiners from the FBI erroneously declared an association between the crime scene evidence and these two men. And in both cases, more importantly for this committee, the FBI agents testified at trials in a manner inconsistent with what was then known as the limitations of the science. They both offered invalid testimony had been, as in another FBI agent in another case which Ms. Levick got an exoneration on a few years ago, also involving the FBI hair unit.

Now, I mention these men—by the way, we have now found at least 11 FBI agents, so this is not simply a bad apple situation, 11 different FBI agent hair examiners who produced scientifically invalid testimony, and I assume the number will grow as we acquire more and more transcripts over a 30-year period.

And, Senator Grassley, with all due respect, the FBI continues to use hair microscopy to this day. They use the technique as a screening test before they do DNA testing. And what we at the Innocence Project are concerned about is the danger of false negatives just as much as we care about false positives.

The point I want to bring up is that these gentlemen—and, by the way, one of the examiners was not just a staff examiner. He was the unit chief for the trace unit.

The point is this: not that these are bad men. None of them are bad men. None of them had malice in their minds when they testified incorrectly in these cases and grossly exaggerated the probative value of the evidence. As a result, innocent men lost three decades of their lives. That is not the issue. The issue is for hair microscopy, when they testified, the FBI—and nobody in the United States had done the basic, essential research to validate that discipline and to validate the limitations of proper testimony. And there were no national standards for microscopy as to what would be appropriately testified to in a court of law. And to this day, in 2012, that research has still not been done. There are no national standards. And the danger of it happening still exists.

And it is not just with hair microscopy. It is the other disciplines as well, the other impression disciplines that were listed in the National Academy of Sciences report, approximately a dozen disciplines. The basic applied and basic research has not been done. National standards do not exist. People are allowed willy-nilly to testify to statistics and probabilities for which there is no scientific basis. That is the purpose of the NAS report. That was their findings, and that is what they hope to accomplish.

So it is not about bad individuals. It is about bad science, if you will, or at least poor science and the way it is being explained to juries. And that has not changed.

The point that we want to make now is that not only do we want that kind of basic and applied research for validation purposes and standards for hair; we want them for all the disciplines. That is what the NAS report called for. It is all well and good that other speakers are here today talking about the importance of accreditation, the importance of certifying every individual in the laboratory, of expanding our educational programs and forensics. That is great.

It will be extremely helpful. But at the cornerstone of the scientific method, of the scientific method that is described in the NAS report, is unless you have the basic research done to validate these methods, to determine what are the proper parameters of testimony and of the science of how to interpret the data, unless you have standards, it is not going to work.

You know, we think about forensic science a lot here because we are the Judiciary Committee. But think about something that is much closer to home. Imagine it was a clinical laboratory and the clinical laboratories were all accredited by the best accrediting organization in America, and all the employees in those laboratories were certified to the highest possible standards. But you as a father or you as a mother wanted to know whether or not your kid has strep throat, and so you have the kid sent to the doctor to have the kid's culture tested, and while you are there, you find out that they never bothered to validate the test for strep throat. So even with the best accreditation and the best certification, you cannot have confidence in the data produced by that laboratory, and you as a mom or dad will not know what to do with your kid. That is the issue.

[The prepared statement of Mr. Neufeld appears as a submission for the record.]

Chairman LEAHY. Thank you.

We are going to have to go now to Scott Burns. We are going to have votes. Senators are going to have to leave.

Scott Burns is the executive director of the National District Attorneys Association, who call themselves "the voice of America's prosecutors" It is one of the largest professional organizations representing district attorneys, states' attorneys, attorneys general, and county and city prosecutors. I was once one of the vice presidents of the National DAs Association. I gave up the opportunity for the glory of being president of it to substitute the anonymity of the U.S. Senate. But I enjoyed my years on the board. He was nominated by President Bush to serve as Deputy Director for State, Local, and Tribal Affairs at the White House Office of National Drug Control Policy. He served in that role until 2009 when he was selected to serve as the executive director of the NDAA, and, of course, he had been elected county and chief prosecutor of Iron County, Utah, for 16 years.

Where is Iron County located?

Mr. BURNS. The most beautiful place in the world, Senator. Southern Utah.

Chairman LEAHY. Southern Utah is beautiful. Thank you. Mr. Burns, please go ahead, sir.

STATEMENT OF SCOTT BURNS, EXECUTIVE DIRECTOR, NATIONAL DISTRICT ATTORNEYS ASSOCIATION, ALEXANDRIA, VIRGINIA

Mr. BURNS. Thank you, Mr. Chairman, Ranking Member Grassley, and members of the committee. Like the other panel members, it is an honor to testify before you today on behalf of America's 39,000 prosecutors, and I think it is important to note up front prosecutors handle 95 percent of all criminal cases in this country. So for all of the Federal judges, U.S. Attorneys, Federal crime labs, 95 percent are State and local prosecutors, women and men primarily in small offices across the country, three or four fewer prosecutors in the office, which is why the National Academy of Sciences report is so interesting to us because, of all of the members, not one prosecutor was on the committee. The chairman, whom I am sure was extremely bright and talented, was an appellate Federal court judge, and appellate Federal court judges do not spend a lot of time in courtrooms trying cases and dealing with evidence.

Since 2009, the committee and you, Chairman Leahy and Ranking Member Grassley have worked hard to gather all of the groups together, and that has not been easy because there are, as you know, many viewpoints on this. And I think getting all of us into this room is an accomplishment in and of itself.

In early 2011, when you introduced Senate bill 132, NDAA had significant concerns with the bill, along with other groups. However, when the bill was first introduced, your staff and others intimated to us that they saw this as a "starting point" where shareholders could weigh in on what they agreed and disagreed on, and that has happened. We believe your approach to this massive undertaking was sound, and we appreciate both you, Chairman Leahy, and ranking member Grassleyfor your willingness to work with all of the shareholder groups. Your staff has been, both of you, absolutely terrific.

Since the National Academy of Sciences released its study, it has been reported that State and local prosecutors have worked to curtail reform efforts on forensic sciences. Nothing could be further from the truth.

Prosecutors also do not oppose research. Prosecutors want and need the best quality evidence and analysis possible to determine the innocence or guilt of the accused. That is our job, to protect victims, to exonerate the innocent, and to point the finger of guilt at those who have committed the crime and hold them accountable.

The commitment of the forensics community for reliable science is evidenced by its investment in their own accreditation process, and they have worked hard over the last decade-plus. Virtually all public laboratories are accredited today, and most of those laboratories were accredited after 2009—excuse me, before 2009.

It is NDAA's belief that non-DNA forensic science disciplines have been demonized in recent years. Some cases are fortunate enough to have DNA evidence, but unlike television, most do not.

As stated on the Innocence Project's Web page, since 1989 there have been 294 post-conviction DNA exonerations in the United States. And while NDAA agrees that even one wrongful conviction of an innocent person is too many—it is a prosecutor's worst nightmare, and we have several prosecutors here on the committee. It is the worst thing that can possibly happen. But we have to put this into proper context. In the United States, there are a minimum of 10 million serious crimes committed and serious prosecutions each year. That does not include traffic offenses. Ten million. Since 1989, that means there have been 220 million cases in America prosecuted by State and local prosecutors. And while 294 post-conviction exonerations are of great concern to us, and to all of us—look at the criminal justice system—in reality those wrongful convictions constitute less than 0.0001 percent, one ten-thousandth of one percent, of the convictions obtained. And while no one from NDAA is naive enough to think that the Innocence Project has uncovered every single wrongful conviction in America, 99.9999 percent is a pretty good record.

It is also important to note, misinformation and hyperbole aside, that the majority of wrongful convictions do not owe their existence to faulty forensic science but, rather, to bad lawyering on both sides of the courtroom, false confessions, and misidentification. Recognizing that, NDAA has created a new committee, the Fair and Truthful Administration of Justice Committee, to educate all of our members about our extraordinary ethical obligations, the phenomenon of false confessions, and the frailties associated with eyewitness identification. In just a few days, our summer conference will have lectures presented from nationally renowned experts in the fields of identification and ethics, and in the near future on the issue of false confessions. We will continue to educate our members on presenting the best forensic evidence available—evidence that both exonerates and convicts.

Finally, I want to thank you, Mr. Chairman, Ranking Member Grassley, and members of the committee, for all you have done and do to support State and local prosecutors and the victims of crime.

I am happy to answer any questions.

[The prepared statement of Mr. Burns appears as a submission for the record.]

Chairman LEAHY. Well, thank you. And I think you would agree, wouldn't you, Mr. Burns, that it is important for everybody in the criminal justice system—the judges, the lawyers, detectives—to be properly trained so they—and when I say lawyers, lawyers on both sides as well as the judges and police officers and everybody else, to be properly trained in the best use of forensic science and what constitutes accurate forensic science?

Mr. BURNS. I absolutely agree, Mr. Chairman.

Chairman LEAHY. I think it is safe to say that the fear of any good prosecutor is the idea that they may convict an innocent person. I sit here and think of the lives of the two gentlemen sitting behind you wrongly convicted. I know if any one of us were behind bars wrongly convicted, it would be hard to keep your sanity knowing that you were innocent. At the same time, nobody is naive enough to think that there are not bad people out there who do need to be convicted. I just want to make sure that if we convict somebody, we convict the right person, because if you convict the wrong person, not only do you create a terrible injustice to that person, but it means the person who committed the crime is still out there, and we want to get that person.

Ms. Spriggs, one of the things I have done in trying to come to grips with this and one of the reasons I appreciate the four of you being here—and the dozens and dozens of people that we have met with in trying to figure out the best way to go—is I feel we have to have a comprehensive national strategy that ensures the reliability of forensic science for everybody, both at the State and local level. I feel we need some strong leadership at the Federal level to have accreditation standards that can be recognized in every State, whether it is a little State like mine or a big State like yours.

Can you tell us how strong leadership at the national level and I guess something like an Office of Forensic Science might give support and guidance to people at the State and local level?

Ms. SPRIGGS. We are looking for coordination and direction on the Federal level. With accreditation, most of the laboratories in the country are following ISO 17025. That is over 400 standards that we must adhere to. Those are the same standards that a pharmaceutical company adheres to or pharmaceutical testing or environmental testing, and that encompasses——

Chairman LEAHY. And that would be the same whether that pharmaceutical company was in Vermont or in California?

Ms. SPRIGGS. That is correct. We would use the same ISO standards from 17025, whether it be Vermont, whether it be California, or whether it be Texas. In with those standards, as I said, there are over 400 standards that we must adhere to. It means that a robust quality management system must be in place. We must have training procedures, educational requirements, protocols must be written, report writing. It also includes testimony monitoring, proficiency testing, making sure all your equipment is calibrated, and validation.

As part of that Federal coordination and direction, one of the reasons that the DNA community has been so successful and is seen as a gold standard is because it has gotten support, rather it has received very little support, for the SWG groups. Remember, each discipline also has a scientific working group underneath it which also is composed of validation of what is needed, what is needed for report writing, education, training, proficiency testing, and interpretation of your casework and your results. But what is really needed is Federal direction and Federal coordination of all those SWG groups so that we are all meeting the same type of SWG standards.

Chairman LEAHY. Well, I think we would all be more comfortable if we knew that. As you said, the pharmaceutical company, whatever State it is in, has to follow standards. This should, too, and I am going to ask Commander Stoiloff, we know we have some very hard-working, very dedicated people in our laboratories, and we also know they are being asked to do more and more every day. It looks awfully easy on television programs. The reality is a lot different, especially because a lot of times you do not have forensic evidence.

Do you agree with me that the State, local, and tribal law enforcement agencies can provide a unique and important perspective if we are trying to do the kind of national standard that I feel we should have but we talked about—safe to say we better talk to people like you and everybody else who is on the front line?

Ms. STOILOFF. I do agree with that, and part of the reason behind that is that all of our organizations represent every forensic service provider, whether or not they are actually part of a laboratory or not. So all of the stand-alone units still need to follow those same procedures. We want to accredit all of the crime scene units, all of the latent print units, and all of the forensic service providers that are not traditionally classified under a crime laboratory.

Chairman LEAHY. Last, Mr. Neufeld, you have been passionate on the need for forensic science reform, and not just in this hearing—you and I have had a lot of discussions not in the hearing room, and I commend you for that passion. I feel that we wanted to help exonerate the innocent, but we also wanted to help convict the guilty. Do you agree with me that if we strengthen our standards in forensic science, it is going to give more confidence in the criminal justice system that we will be able to make sure the innocent are not convicted but the guilty are convicted?

Mr. NEUFELD. I think there is no question, Senator Leahy, that if we had robust national standards in place, then we could be assured that a laboratory in Iowa City or a laboratory in Montpelier, Vermont, were turning out the same data, and that would be a huge boon for everybody.

But where I would perhaps disagree with the last remark was that there is a fundamental difference between what we are talking about here and a pharmaceutical company. And the fundamental difference is that before the pharmaceutical company can be accredited or the clinical laboratory that uses their products can be accredited, there has already been an NIH and an NSF that has spent a lot of money doing basic and applied research. There has already been an FDA that passed on whether or not that product was ready for prime time. And there has already been a national CLIA set up to determine how those products are to be used in a reliable fashion. Nothing like that exists right now.

Chairman LEAHY. Notwithstanding that, that does not mean that we cannot have standards that apply—the same kind of standards to crime labs and forensic scientists, does it?

Mr. NEUFELD. I am sorry. I misunder——

Chairman LEAHY. Notwithstanding that maybe we can use analogies, we can talk about testing air bags on cars and everything else, but the fact is we can have—no matter which analogy you use—we can have standards that would give, reliable standards throughout the country, can we not?

Mr. NEUFELD. We can have reliable standards, and certainly the people who practice those trades in various crime laboratories have a vital role to play, because, obviously, it is essential that independent scientists be made aware of the particular problems and uses and applications that those crime lab people are dealing with on a daily basis. And certainly there has to be buy-in from them. But, ultimately, independent scientists are going to be there to set those standards, which will be extremely useful for all of us in the country—crime victims, defendants, lawyers, judges, and the public at large.

Chairman LEAHY. Thank you.

Senator Grassley is also one of the most senior members of the Finance Committee. I know he is supposed to be there, and I thank him for spending this amount of time here. I will yield to you for questions, and I realize you have to leave afterward.

Senator GRASSLEY. I thank you for your consideration.

You probably know that last year Chairman Leahy put in his bill he has consulted widely with stakeholders such as those represented here today, and also his staff has engaged with my staff to find common areas of agreement and look for ways to move forward. So I would ask Stephanie and Jill and Scott, as you have considered that legislation, would you suggest any specific changes?

And I do not want you to take up all 5 minutes with suggestions now, but maybe one or two from each of you, and then you can submit additional information to me in writing. Stephanie.

Ms. STOILOFF. I am sorry. Could you be more specific as to what——

Senator GRASSLEY. In regard to Chairman Leahy's bill, the Criminal Justice and Forensic Science Reform Act, any changes you would suggest in that?

Ms. STOILOFF. Well, I can tell you that I am communicating continually with Senator Leahy's staffers to make continual improvement, so we have an open dialogue and we make suggestions all the time. And most of that has been to consider the law enforcement response, to consider that all local agencies—you know, every level of law enforcement be considered. That is a big part of the problem when you consider a national strategy—that everybody be included—because there are different levels of resources available throughout the country for each agency.

Senator GRASSLEY. Let us go on to Jill.

Ms. SPRIGGS. We believe the process is working well, starting with the existing standards that we already have, the 17025 and the SWG groups. But we are open to any changes that might be needed and are welcome to discussions, and we are very thankful for the process.

Senator GRASSLEY. But you are not in the process—you are not suggesting any specific changes. You are just looking at what other people suggest. Is that what you just told me?

Ms. SPRIGGS. That is correct, Senator.

Senator GRASSLEY. Scott.

Mr. BURNS. Well, I would concur with your statements. As I said in my opening remarks, your staff has been remarkable, as has Chairman Leahy's, in reaching out to prosecutors, to law enforcement, to the defense bar, and others, and that has just been a wonderful thing.

The only main suggestion that prosecutors have is that there be more practitioners in the governance structure, more law enforcement represented, more prosecutors represented, and we have had specific discussions with your staff and others about that.

Senator GRASSLEY. OK. I am not going to go back through what I said in my opening statement about my work with Dr. Whitehurst, but that experience makes me skeptical about entrusting scientific standard setting to a Government bureaucracy. The Federal Government does not have a very good record on accountability and transparency. In the original and now expanded review of the FBI lab's hair and fiber analysis, the Innocence Project was given access but not the public.

Again, to the three of you that just answered my first question, do you think that the Federal Government has the resources and technical capability to oversee the use of forensic science across the country? And I would ask for a short answer, starting with you, Stephanie.

Ms. STOILOFF. I think with the creation of strong national leadership, I think they do.

Senator GRASSLEY. OK. Jill.

Ms. SPRIGGS. I agree with Stephanie. With a strong national leadership and coordination and direction, they do.

Senator GRASSLEY. Scott.

Mr. BURNS. Concur.

Senator GRASSLEY. OK. How would such oversight affect the work of State and local prosecutors? Again, Stephanie, Jill, and Scott.

Ms. STOILOFF. Affect the prosecutors?

Senator GRASSLEY. Yes, affect prosecutions, the work of local and State prosecutors.

Ms. STOILOFF. Well, I think that strong national leadership creates a program that would have—as stated earlier, it creates stronger confidence in the system. We feel it already is a very robust system, so it should just increase their confidence that they have in the technology we provide.

Senator GRASSLEY. Jill.

Ms. SPRIGGS. I believe it can help with the prosecution by not only helping with the coordination and direction but also firming up those existing scientific working groups that we already have and not throwing those out and starting over but enhancing those, as well as looking at accreditation with the ISO 17025 standards.

Senator GRASSLEY. OK. Scott.

Mr. BURNS. I guess as long as the good outweighs the bad, if the good is having standards, accreditation, everybody reading from the same playbook and coordinated, that is the good. The bad is I do not know that prosecutors, 39,000 of them across the country, would feel comfortable with a bureaucracy in Washington, D.C., telling them everything about the handling of forensics unless, as I said before—which has not happened in a lot of instances. There is not a single voice at the table that is a prosecutor or a defense lawyer or a judge. I just think that is crucial, Senator.

Senator GRASSLEY. Could I ask one more question?

Chairman LEAHY. Of course.

Senator GRASSLEY. This will be my last one because I have to go. I will submit some questions for answer in writing. But supposed Federal involvement is needed. The question then comes: Should there be direct regulation of what happens in State courtrooms? And I will start with Stephanie.

Ms. STOILOFF. I think that would have to be evaluated as it were to evolve. I do not know that I would say that anything needs to be regulated to that extent. I think there needs to be support there to support the process. If you have strong Federal leadership—and the evolution of that in practice would be a different story. I do not think we could—at least I do not think as law enforcement we can make that statement.

Senator GRASSLEY. Jill.

Ms. SPRIGGS. We are not looking for Federal oversight. We are looking for leadership and direction and cooperation.

Senator GRASSLEY. Scott.

Mr. BURNS. I guess we have had these discussions at NDAA for some time, and the frustration that we have, for example, the National Advocacy Center, those in the Federal system that do 5 percent of the prosecution are given about $50 million a year; State and local prosecutors are now down to zero. We have some grants and we have some ability to train, but we are supportive of individual States making determinations and decisions in their own States, but the big emphasis on our part, Senator, is consistent training.

Senator GRASSLEY. Thank you, Mr. Chairman.

Chairman LEAHY. Thank you.

Mr. Neufeld, do you want to add anything to this?

Mr. NEUFELD. The only thing I would add to your last question, Senator Grassley, is I do not believe that the Federal Government can regulate what goes on in this area in the State courts. The kinds of fixes that we have all been talking about and what the legislation talks about are fixes upstream in laboratories. And if we improve things in laboratories, then it will have that kind of impact on the courts without the Federal Government stepping on anyone's toes.

Chairman LEAHY. Let me suggest this: We have heard actually some areas where you agree but some areas where you would make some changes. I noted earlier how much I appreciate the fact you have all worked with me and with Senator Grassley and with our staffs on this. I think we all agree, especially with the changes in science, and also agree with the lack of funding that we need in some of these areas, that we need to improve the system and the standards, and we need to have, no matter what State you are in, if you are being prosecuted in a State court, no matter what State you are in, that you know there are some basic good standards.

Can I ask all of you if you will continue to work with me and the Committee in trying to develop legislation that we can all agree would be an overall improvement? Commander Stoiloff, would you agree to that?

Ms. STOILOFF. Yes, sir.

Chairman LEAHY. And Ms. Spriggs.

Ms. SPRIGGS. Yes, sir.

Chairman LEAHY. Mr. Neufeld.

Mr. NEUFELD. Yes, sir.

Mr. BURNS. Absolutely, Chairman.

Chairman LEAHY. Thank you. Well, I still go back to the same thing, that I considered myself a pretty confident, effective prosecutor, but, boy, I always wanted to make sure that I did not convict the innocent for two reasons: one, the horrible, horrible thing that it does to an innocent person, but it also meant that whoever committed the crime is still out there.

So let us work together on this. It is a world far more complex than what we see on an hour-long TV program which has to wrap up in 43 minutes, or whatever it is. It is a lot more complex than that.

Senator Franken, let me turn to you.

Senator FRANKEN. Thank you, Mr. Chairman, and thanks to the witnesses. First, I would like to say to Commander Stoiloff and Chief Spriggs, thank you for being here today. I know that many crime labs are overworked and underfunded. You have a tough job. The NAS report was fairly critical of the current state of forensic science in the U.S., but I think that criticism is directed as structural problems that were identified in the report and should not be directed at the men and women who do the hard work, the honest hard work in our Nation's crimes labs, and I think it is important that we remember that.

I also would like to thank Mr. Odom and Mr. Tribble for being here. I just cannot imagine what you have been through, and it takes tremendous courage to be here today and sort of remind us why reform is so important, so thank you.

Mr. Neufeld, I attended a hearing a few weeks ago on solitary confinement practices, and Anthony Graves testified. He was wrongfully convicted and forced to spend 18 years behind bars, including many years in solitary confinement. In March I attended a hearing at which Thomas Haynesworth testified. He, too, spent time in prison for a crime he did not commit.

Some people point out that wrongful convictions are rare, but Mr. Graves and Mr. Haynesworth provided a forceful reminder that even one wrongful conviction has horrendous effects on the accused and threatens the credibility of our judicial system.

I know that the Innocent Project has identified 293 wrongful convictions in the last 20 years, or about 14 per year. But aren't there other cases that we do not know about, too? What is the real scope of the problem? And what role does forensic science play in these cases?

Mr. NEUFELD. Sure. Thank you, Senator. The Innocent Project plays a very limited role. All we do is we look at those people who are exonerated by DNA testing. There are hundreds of other people who have been exonerated by other types of evidence around the country, but they are not on our list because it was not a DNA exoneration.

It has been pointed out by other people here today that, regrettably, this miracle called DNA is only usable in a very small minority of the violent crimes. So we are limited to working with that small minority.

Moreover, in many of the cases that we take on, the biological evidence has been lost or destroyed in the intervening years. It is kind of like if a tree falls in the forest. If you do not hear it, you might say, you know, well, it is fine, it is still standing. The best example of it is the FBI's decision last week that they are going to have a review of thousands and thousands of cases where their analysts wrote reports and testified in many, many instances in excess of the limits of science.

Now, those cases have not been tested yet. We may find dozens and dozens more wrongful convictions. We do not know. And we do not know how many people have been wrongfully convicted where there is no biological evidence to exonerate them. So it is actually quite confusing for someone to suggest a certain numerator and a certain denominator. It has nothing to do with reality.

Senator FRANKEN. Sure. In your written testimony, you noted, "There is a global market for technologies with an application to public safety, and the United States has the capacity to capture that market with a national commitment today."

This is an interesting point, and we know that investments in forensic science will benefit the criminal justice system, but can you talk a bit more about the potential collateral benefits of——

Mr. NEUFELD. Sure. The best example currently is in the DNA area where you do have a company and other companies that make the software and the hardware that have made millions, indeed billions of dollars by being able to sell that product not only here at home but abroad. There is no question that the United States has the right and the ability to be the leader in developing new technologies for fighting crime, for fighting terrorism, and we can market those products around the world.

I would also say—and it is a different kind of product, but that product is the rule of law. And to the extent that we can become first and foremost in the world in developing more rigorous scientific techniques for solving crime, wouldn't that be a marvelous example to send that all over the world so other countries will not decide cases based on politics or philosophy or associations but, rather, on hard scientific evidence?

Senator FRANKEN. Thank you.

I see my time is up, but may I continue, Mr. Chairman?

Chairman LEAHY. Go ahead.

Senator FRANKEN. OK. Thank you.

Mr. Burns, in your testimony, you noted that there may be a perception out there that the law enforcement community is resistant to forensic science reform but that, in fact, nothing could be further from the truth. I am glad to hear you set the record straight on that point because it seems to me that the law enforcement community would actually benefit from improvements in forensic science, improvements in funding and research and training and certification standards.

Can you talk a little bit about why availability of accurate and validated forensic science is so important to prosecutors?

Mr. BURNS. Well, first of all, thank you for the question, and I guess the key for prosecutors and law enforcement is that we want to be included. We were not included in the National Academy of Science report.

We also want to make it clear, because we get beat up every day, Senator, over the exceptions, and if there are 220 million cases handled since 1989, 220 million—and that is a minimum—of serious offenses, the only time prosecutors come to the media is, you know, when the plane crashes, not when they land safely. And the Innocence Project has done a great job at finding horrific cases, ones that keep prosecutors up all night long, and taking them around the country and telling those stories, and then there is some perception that the entire system—forensic, prosecutors, ethical—is broken, and that is, in our humble opinion, simply not the truth. Nobody talks about homicides are down 50 percent in this country over the last 30 years—50 percent. Burglaries, rapes, robberies are down 30 and 40 percent. This is a much safer country, and a lot of that is because not only forensics but because of the defense bar, prosecutors, and a heightened sophistication of our judicial system.

So I just want to make the point that the system is not broken and the sky is not falling.

Senator FRANKEN. Well, thank you, and I do have a couple of other questions, but I will just submit them for the record, if that is OK.

Chairman LEAHY. Thank you very much.

Senator FRANKEN. Thank you, Mr. Chairman, and thank you for this hearing.

[The questions of Senator Franken appear under questions and answers.]

Chairman LEAHY. With that, we will stand in recess, and I thank all of you for coming here, and I appreciate also the willingness to work with us. We will get a piece of legislation, I think, that we can all agree on. But more importantly than just having a piece of legislation, we will have a better system as a result.

So thank you all very much. We stand in recess.

[Whereupon, at 11:21 p.m., the Committee was adjourned.]

[Questions and answers and submissions for the record follow.]

QUESTIONS AND ANSWERS

National District Attorneys Association
99 Canal Center Plaza, Suite 510, Alexandria, Virginia 22314
703.549.9222/703.836.3195Fax
www.ndaa.org

SENATE JUDICIARY COMMITTEE HEARING ON "IMPROVING FORENSIC SCIENCE IN THE CRIMINAL JUSTICE SYSTEM"

Question for the Record for

Scott Burns

Executive Director
National District Attorneys Association (NDAA)

Question from Senator Franken:

1. In your written testimony, you say this:

> As stated on the Innocence Project's webpage [citation], since 1989 there have been 289 post-conviction DNA exonerations in the United States. . . . [T]his number needs to be taken into proper context[.] . . . In the United States there are, at minimum, 10 million cases per year (not including traffic offenses) where serious crimes have been committed, meaning since 1989 there have been at least 220 million cases in America involving serious crimes. While 289 post-conviction exonerations are of real concern to NDAA, in reality these wrongful convictions occurs [sic] less than one-hundredth of one percent of the time in America's courtrooms. . . . [I]t is important for us to remember that the vast majority of the time during criminal cases – more than 99.99% of the time – the prosecutor . . . gets the case right.

Thus, you compare the total number of Innocence Project exonerations to the total number of cases, but it seems to me that the relevant comparison – the proper context – is a comparison of total wrongful convictions to all convictions.

a. What is the source of your data regarding the 10 million cases per year?

"Examining the Work of State Courts: An Analysis of 2009 State Court Caseloads", which was a joint project of the Conference of State Court Administrators, the Bureau of Justice Statistics at the U.S. Department of Justice and the National Center for State Courts. A copy of this study can be found at the following:

http://www.courtstatistics.org/Other-Pages/CSP2009.aspx

b. Of those 10 million cases, how many resulted in convictions?

While this specific study doesn't address this question, most public resources on the subject estimate that the conviction rate in U.S. state courts for felony charges since 2000 is between 75-85%, while the federal conviction rate for felonies is above 90%.

http://bjs.ojp.usdoj.gov/content/pub/ascii/dccc.txt

http://www.justice.gov/usao/reading_room/reports/asr2010/10statrpt.pdf

c. Is it true that, since 1989, there have been more wrongful convictions than the 293 that the Innocence Project has identified?

While it is speculative for NDAA to answer "yes" or "no" to this question, in my written testimony I do acknowledge that it is very likely that there have been more wrongful convictions than the 293 that the Innocence Project has identified to date. The excerpt from my written testimony is below:

"While no one from NDAA is naive enough to think that the Innocence Project has uncovered every single wrongful conviction in America..."

d. In total, how many wrongful convictions have there been since 1989? If it is not possible to answer this question, please explain why.

It is not possible for me to answer this question at this time. In order to give you a definitive answer to this question, Senator, every case since 1989 would need to be reviewed – it is simply not possible, both monetarily and logistically, to perform such a task. During troubling financial times, it would cost America's taxpayers hundreds of millions of dollars and take years to complete, never mind the additional burdens this would place on state and federal court dockets which are stretched to begin with.

To ensure fairness for all for those convicted of a crime in either a state or federal court, there is an appeals process in order to confirm or overturn the initial ruling:

http://www.uscourts.gov/federalcourts/understandingthefederalcourts/howcourtswork/TheAppealsProcess.aspx

One way the American taxpayer can help ensure fairness within the court system is to fund programs which adequately train both prosecutors and public defenders to ensure a fair and impartial trial for the accused. Programs such as the National Advocacy Center for State and Local Prosecutor Training and training programs for prosecutors and public defenders administered through the Byrne Competitive Program have been gutted over the past 10 years or, in the case of the National Advocacy Center, have been eliminated altogether.

2. In May 2012, Professor Samuel Gross of Michigan Law School produced a report in which he stated the following:

> [Exonerations] merely point to a much larger number of tragedies that we do not know about. The most important conclusion of this Report is that there are far more false convictions than exonerations. That should come as no surprise. The essential fact about false convictions is that they are generally invisible: if we could spot them, they'd never happen in the first place.

e. Do you agree with this statement? If not, with which aspects of it do you disagree?

Professor Gross's report is, frankly, absurd. He is essentially making a claim about something that is "unknowable" and without any basis in fact. The only response I can give you is that I believe that America has the best criminal justice system in the world, that America's 39,000 prosecutors go to work every day to do justice in each individual case on behalf of the victims of crime, and that a wrongful conviction is our worst nightmare, but such cases are a gross anomaly – as I stated in my written testimony - and anyone that professes anything else is intellectually dishonest.

National District Attorneys Association
99 Canal Center Plaza, Suite 510, Alexandria, Virginia 22314
703.549.9222/703.836.3195Fax
www.ndaa.org

SENATE JUDICIARY COMMITTEE HEARING ON "IMPROVING FORENSIC SCIENCE IN THE CRIMINAL JUSTICE SYSTEM"

Question for the Record for

Scott Burns

Executive Director
National District Attorneys Association (NDAA)

Question from Senator Klobuchar:

"Many people in the criminal justice system have identified what has come to be known as the "CSI effect"—that is, where jurors expect sophisticated scientific evidence because that is what they have seen on TV shows like CSI.

I know from my time as a prosecutor that forensic evidence is not available in many run-of-the-mill cases. These cases—such as auto theft or assault cases—often do not yield any forensic evidence. Can you comment on this? Is there a way to counter the unrealistic expectations that juries may have developed in recent years?"

Yes, Senator Klobuchar, the "CSI" affect remains a constant issue that America's prosecutors must address. As you accurately state, juries across the country have this notion that DNA evidence, fingerprints or some type of forensic evidence must be a part of the state's case if the burden of proof beyond a reasonable doubt is to be met.

What prosecutors are doing (and it's probably the same thing you did as a prosecutor) is address the issue at the very beginning of the case (in the jury selection process) as well as in the opening statement. NDAA and the individual state prosecution associations incorporate this issue in trainings nationwide, especially when training new and inexperienced prosecutors. It is not uncommon for a prosecutor to say to the jury, either in voir dire or the opening statement "I am not an actor and this case will not be resolved in an hour; in fact, unlike your favorite crime show, there is no DNA evidence in this case nor will you have fingerprint evidence, blood spatter or ballistics...this is an assault case". That said, prosecutors are also doing everything possible to present evidence to juries that takes advantage of new technology and more and more videos (everybody has a camera in their phone) and pictures are being used as evidence, as is evidence from social media sources (Facebook, MySpace, twitter, emails and texts) that has greatly enhanced prosecutors ability to prove the requisite elements of a case.

Thank you, Senator Klobuchar, for your continued support for America's prosecutors and for your keen understanding of technical prosecutorial issues.

PETER NEUFELD
ANSWER IN RESPONSE TO SENATOR AL FRANKEN
QUESTIONS FOR THE RECORD
SENATE JUDICIARY COMMITTEE HEARING ON
"IMPROVING FORENSIC SCIENCE IN THE CRIMINAL JUSTICE SYSTEM"

Question for Peter Neufeld

1. Some have argued that the courtroom is the best place to test the reliability of forensic evidence in any particular case – that any problems with the forensic evidence will come out through cross-examinations. For example, if a prosecutor tries to use faulty fingerprint analysis to make her case, the defense lawyer will be able to poke holes in that evidence when he presents his case.

- **a.** How would you respond to the suggestion that cross-examination is the best way to test forensic methods?
- **b.** From the fact that a particular piece of forensic evidence is admissible in court, does it follow that the evidence is reliable?
- **c.** Would the development of an independent forensic science research agency compromise prosecutors' ability to present reliable evidence in court?
- **d.** Is the development of an independent forensic science research agency inconsistent with the adversarial criminal justice process?

ANSWER:

a. Although the conventional wisdom once stated that a sound defense and cross-examination would enable courts to properly assess the strength of forensic evidence, the NAS report unequivocally states, and the post-conviction DNA exoneration cases clearly demonstrate, that scientific understanding of judges, juries, defense lawyers and prosecutors is wholly insufficient to substitute for true scientific evaluation and methodology. It is beyond the capability of judges and juries to accurately assess the minutiae of the fundamentals of science behind each of the various specific forensic assays that the NAS called into question. Asking them to evaluate the reliability of a forensic technique to determine the truth in various cases is an unfair and dangerous burden for us to place on their shoulders.

According to the NAS report, "[f]or a variety of reasons – including the rules governing the admissibility of forensic evidence, the applicable standards governing appellate review of trial court decisions, the limitations of the adversary process, and the common lack of scientific expertise among judges and lawyers who must try to comprehend and evaluate forensic evidence – the legal system is ill-equipped to correct the problems of the forensic science community. In short, judicial review, by itself, is not the answer." This is particularly important because the overwhelming majority of cases are resolved with plea bargains, necessitating defense lawyers and prosecutors – with no judicial involvement – to interpret and rely on the reports' conclusions as a basis for making an important decision affecting the liberty of life of the accused. It is absolutely clear – and essential – that the validity of forensic techniques be established "upstream" of the court, before any particular piece of evidence is considered in the adjudicative process.

b. No. For years, soil comparison, fiber comparison, and hair comparison analyses – examples of an area of forensics called "pattern evidence" techniques – have been accepted as reliable in courts; however the NAS was unequivocal that microscopic hair analysis, soil comparison and fabric print analysis have not been tested to determine their scientific reliability or validity. As a result, it is impossible to know how many other soil samples might be similar to soil from the crime scene or the likelihood that a common fiber may come from a specific piece of clothing, and there is not adequate empirical data on the frequency of various class characteristics in human hair. Without an existing database or set of "knowns" a proper statistical inference of likelihood cannot be made.

c. We strongly believe that an independent forensic research endeavor would benefit all players of the criminal justice system—including and especially prosecutors. Since the NAS report was released, many defense attorneys have been writing briefs about the faultiness of forensic sciences as a major part of their defense arguments. They have been arming themselves with the critiques presented in the NAS report. Because the report is mentioned in a recent Supreme Court case, it has precedential authority in the courtroom. Prosecutors have little or no recourse in refuting this argument because of the lack of reliability and accuracy of these forensic science techniques. If prosecutors back the initiative to validate and assess the reliability of forensics based on statistical accuracy, then this will guarantee that the evidence presented in court is close to if not irrefutable.

d. No. On the contrary, an independent forensic science research agency will enhance the adversarial criminal justice process. The landmark case *Daubert v. Merrell Dow Pharmaceuticals* created a standard by which judges act as gatekeepers to assess the admissibility of expert testimony, including forensic science evidence. The case established four general factors for judges to consider which include: (1) whether the theory or technique has been tested; (2) whether it has been subjected to peer review and publication; (3) the known or potential error rate of the scientific technique; and (4) whether the theory or scientific technique has widespread acceptance in the scientific community. In theory, *Daubert* should have an extraordinary impact on criminal litigation. However, *Daubert* has been implemented more rigorously in civil cases to protect civil corporate defendants than in criminal cases to protect individual defendants, where life and liberty are at risk.[1] The judicial process has not been adequate to provide the obligatory controls over unvalidated or unreliable evidence. In part, this is because the actors in the judicial system are not scientists and in part because attorneys generally do not have the sufficient scientific understanding of the weaknesses of forensic evidence to bring these challenges to judges in a way that would facilitate their gatekeeping responsibility. Conducting research and setting standards that quantify the relative accuracy and reliability of forensics upstream of the courtroom will bring those techniques in line with other bodies of science and the standards that *Daubert* has set and provide the basis of information that judges can rely upon in order to better evaluate evidentiary standards.

---

[1] Neufeld, PJ, The (Near) Irrelevance of *Daubert* to Criminal Justice and Some Suggestions for Reform. American Journal of Public Health, Vol. 95, No. S1 (2005).

PETER NEUFELD
ANSWERS IN RESPONSE TO SENATOR CHARLES GRASSLEY
QUESTIONS FOR THE RECORD
SENATE JUDICIARY COMMITTEE HEARING ON
"IMPROVING FORENSIC SCIENCE IN THE CRIMINAL JUSTICE SYSTEM"

Question for Peter Neufeld

In your testimony, you referred to the 297 people your organization has helped exonerate through post-conviction DNA testing. Please provide the following information with regard to those individuals.

1) **Exoneration because of improper forensic science.**

   a) **How many of those exonerated were convicted in a case involving improper use of forensic science? Please explain what constitutes your definition of the improper use of forensic science and how you determined, in any particular case, whether it was involved and whether it contributed to the wrongful conviction.**

   Fifty three percent of the nation's DNA exonerees were convicted in cases involving improper use of forensic science. Improper use was determined through documented forensic science testimony or analyses, and sometimes with the aid of the underlying case file. Improper use was found where the analysis or testimony was unvalidated or otherwise failed to comport with the scientific method or where the lab or forensic scientist failed to disclose data, exculpatory or otherwise helpful to the defense.[1] These categories are defined in the following manner:

   - **Improper Testimony or analysis**: testimony or analysis which drew conclusions beyond the limits of science as known at that time.[2] Also included in this category are cases in which there was negligence in analysis, fabrications/alterations of reports and possible failures to conduct elimination testing or comparison. We do not separate out misconduct, as it is not possible in most cases to know the intent of the witness.
   - **Unvalidated testimony or analysis**: discipline that has not been validated *and* the testimony or analysis suggested a possible inclusion (source is consistent with/similar to/cannot be excluded, etc).
   - **Failure to disclose exculpatory forensic evidence**: withholding laboratory reports, analysis, data, or the very existence of evidence.

---

[1] The percentage of cases involving unvalidated/improper forensic science is 52% when excluding the cases where exculpatory forensic evidence was not turned over to the defense (n=11).

[2] See the following article for more details about what specific types of testimony were considered improper: Garrett, Brandon L. and Neufeld, Peter J., Invalid Forensic Science Testimony and Wrongful Convictions (March 16, 2009). Virginia Law Review, Vol. 95, No. 1, 2009. Available at SSRN: http://ssrn.com/abstract=1354604.

b) **Please provide a breakdown by forensic science discipline (i.e., serology—50 cases; hair analysis, 70 cases; etc.).**

A breakdown of the forensic science disciplines can be found in Table 1.

c) **Please provide a breakdown by whether the use of improper forensic science was as a result of a) alleged scientific invalidity of the particular discipline; b) improper application of the discipline; or c) misconduct by a witness testifying as to what the forensic evidence in the case demonstrated.**

Please see Table 1 for a breakdown by forensic science discipline of whether the use of forensic evidence was a) unvalidated or b) based on improper testimony or analyses. Again, note that we do not separate out negligence and misconduct.

d) **Please provide a breakdown by year of conviction (i.e, 1980—10; 1981—7; 1982-5; etc.)**

Year of Conviction	**Number of Exonerations Involving Forensic Science Problems**
1974	1
1978	6
1979	2
1980	2
1981	7
1982	7
1983	13
1984	7
1985	12
1986	13
1987	11
1988	16
1989	17
1990	14
1991	3
1992	6
1993	2
1994	2
1995	3
1996	4
1997	2
1998	3
1999	1
2003	2
2005	1

2) **Context for understanding forensic science and exonerations.**

a) **How many requests for support from convicted persons do the Innocence Project and its affiliates receive, per year and in total since its founding?**

The Innocence Project does not have any affiliates and can, therefore, only respond on behalf of itself. While this organization participates in the Innocence Network with other organizations working to prove the innocence of the wrongfully convicted, each project is an independent organization and does not operate under the Innocence Project's control.

The following chart represents the number of requests that the Innocence Project has received since its founding.

Total: Over 44,000 requests.

Year(s)	**Intake**
Pre-1997	2213
1997	1383
1998	1122
1999	1931
2000	2040
2001	4565
2002	3059
2003	2304
2004	2092
2005	2410
2006	3202
2007	3366
2008	3213
2009	3068
2010	3117
2011	3407

b) **How many cases do the Innocence Project and its affiliates accept for further investigation, per year and in total since its founding?**

As noted above, the Innocence Project does not have any affiliates, and therefore can only respond on behalf of itself. Since its founding, the Innocence Project has accepted 1,250 cases.

c) **In how many cases have the Innocence Project and its affiliates opened a case and closed it when its investigation indicated guilt?**

As noted above, the Innocence Project does not have any affiliates, and therefore can only respond on behalf of itself. The Innocence Project closed approximately 435 cases between 2004 and June, 2012. Of these cases, 177 reached the testing stage.

- In 38% of cases, probative exculpatory results led to exonerations.
- 42% of cases resulted in DNA inclusions. All of our clients sign an agreement to share their DNA testing results with law enforcement and the prosecution, so when inculpatory results are obtained, all relevant law enforcement agencies are made aware in the event future testing requests are made.
- In 11% of cases, DNA results were not probative. These cases typically involved profiles of the victim and/or a consensual sex partner, revealing no foreign profiles; cases where an unknown profile is found, but it alone is not enough to exonerate the individual seeking testing, including cases where the foreign DNA did not elicit a CODIS hit which would have been necessary to continue investigation in some of our more complicated cases.
- In 9% of cases, testing did not produce results or there was not enough DNA found to produce a useable profile.

d) In how many cases have the Innocence Project and its affiliates confirmed guilt?

As noted above, the Innocence Project does not have any affiliates, and therefore can only respond on behalf of itself. Please see the above data. While we share the DNA testing results with all relevant law enforcement agencies, we do not confirm guilt in any cases. If the testing results include the client on probative evidence, we close the case.

e) If you do not collect and maintain these statistics, please explain why.

As noted above, the Innocence Project does not have any affiliates, and therefore can only respond on behalf of itself. While we are pleased to share these statistics with the Committee, please note, with respect to questions 2(c) and 2(d), that statistics provided here are from 2004 onward. In 2004, the Innocence Project instituted a more data-driven internal system for gathering and aggregating data.

3) Innocence Project use of forensic science?

a) Have the Innocence Project and its affiliates ever used as a consultant, advisor, or as an expert witness (or in any other capacity) a person who works at a laboratory that is not accredited by a nationally or internationally recognized organization or who is not certified by a nationally or internationally recognized organization?

As noted above, the Innocence Project does not have any affiliates, and therefore can only respond on behalf of itself. Speaking only for the Innocence Project, we can confirm that we have worked with several consultants over the last twenty years who are leading academic research scientists in the fields of genetics, molecular biology, population genetics and statistics but whose labs are not subject to forensic accreditation and who themselves are not subject to forensic certification. Among the group are scientists who have been selected for National Academy of Science committees or who have assisted Congress and the executive branch in formulating forensic policy. We have also worked with an expert witness from an unaccredited laboratory named Dr. Edward Blake, a DNA scientist. While Dr. Blake currently works with an accredited laboratory, even during his tenure at the unaccredited Forensic Science Associates, he was an internationally respected DNA scientist and was able to provide scientific services to prosecutors and to the Innocence Project at a level that other DNA laboratories, even those that were accredited, were unable to provide, especially in the area of DNA extraction. The work product and attention to detail that Dr. Blake was able to provide was also unmatched by virtually any other DNA lab. Indeed, in the capital case of *Virginia v. Earl Washington*, an audit produced at the direction of the Governor revealed that Dr. Blake's work was more reliable than that of the accredited state lab and that Dr. Blake had uncovered material errors in the performance of DNA testing and analysis by the accredited state laboratory. We would be happy, upon request, to provide you with a copy of a sample laboratory report produced by Dr. Blake.

While a useful and basic tool for crime lab oversight, the NAS report states that "accreditation is just one aspect of an organization's quality assurance program,"[3] and is not sufficient for oversight of the forensic process or to guarantee an error-free analysis. The NAS report made 13 recommendations for the improvement of scientific culture in the forensic system and accreditation was only one of the many important recommendations. Accreditation provides assurance that protocols for laboratory operations, evidence handling, personnel management, review of lab reports, and monitoring of testimony are documented and take place. Accreditation alone does not guarantee, nor is it determinative of the correctness of the forensic product.[4] It also does not ensure that the best standard operating procedures, protocols, or polices are being utilized by the laboratory or that the laboratory has adopted the best practices. Since there are no national standards for almost all non-DNA forensic disciplines, laboratories are free to adopt their own standard operating procedures, protocols, or polices, which can vary by laboratory. In the absence of rigorous scientific research, accreditation will continue to allow laboratories to use methods that have not been fully tested for their limits and capabilities.

---

[3] Strengthening Forensic Science in the United States: A Path Forward, Committee on Identifying the Needs of the Forensic Science Community, The National Academies Press (2009), p 195. (hereinafter, *NAS Report).*

[4] Recent investigations of crime laboratories with histories of accreditation have yielded investigations in North Carolina (See Swecker and Wolf (2010) report at http://media2.newsobserver.com/smedia/2010/08/18/13/SBIreview.source.prod_affiliate.156.pdf), New York (See New York State Inspector General reports on Monroe County Crime Lab (2012), http://ig.state.ny.us/pdfs/MonroeCountyLaboratoryReport.pdf, and Nassau County Crime Lab (2011), http://ig.state.ny.us/pdfs/Investigation%20into%20the%20Nassau%20County%20Police%20Department%20Forensic%20Evidence%20Bureau.pdf), and Texas (See Texas Forensic Science Commission 2012 letter to El Paso Police Department Crime Laboratory, http://www.fsc.state.tx.us/documents/El_Paso_Recommendations.pdf).

Many more strategies are needed to ensure a valid and reliable scientific work product and accreditation does not cover them all. Therefore, because we believed that Dr. Blake's laboratory operated using the best scientific practices, with proper transparency, and using the highest level of documentation, we were comfortable with utilizing his laboratory's services despite the absence of the accreditation title. Dr. Blake's scientific credentials and reputation are equally shared by both the defense and by prosecutors.[5]

b) If fingerprint analysis were available as the only means to exonerate one of your clients, would you rely on it, notwithstanding its alleged lack of scientific validity? Similarly, your website touts the case of Cameron Todd Willingham, whose claims to innocence are based on re-analysis by a new arson investigator of the arson investigation used to convict him. Do you therefore accept that contemporary arson investigation is reliable evidence?

The Innocence Project only takes on cases when we believe DNA testing will provide dispositive proof of innocence.[6] Post-conviction DNA testing is used as the measure of a possible wrongful conviction because, to quote the NAS, "[w]ith the exception of nuclear DNA analysis, no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source."[7]

With regard to fingerprints, we do support best practices in fingerprint analysis that are in line with the NAS Report's recommendations. All the stakeholders interested in forensic science improvement recognize the vital need to do research. Further research can not only more fully validate the practice of latent print identification, but we hope it can provide a scientifically validated basis for expressing a statistical statement as to the rarity or commonality of an association. Such a development would be more in line with the principles of science than the opinion based testimony that is currently proffered. The NAS report's recommendations about avoiding observer bias in the analysis of prints are critical and shielding or insulating examiners from cognitive bias may be more easily implemented as we await the development of a validated statistical system for providing testimonial weight to a positive association. Lastly, the scientific burden to exclude a person from a fingerprint is different from the scientific burden to prove that an individual is the source of a particular print. As revealed in some of our DNA exoneration cases, there have been instances where probative prints were declared "inconclusive" or insufficient to do analysis but were actually exclusions of a defendant.

---

[5] CV of Dr. Edward T. Blake (See pgs. 14-70 of 70), available at http://www.forensica.com/fasc/doc/cv/eb.pdf ,(last accessed, 8/3/2012).

[6] In very few of our cases, exceptional cases, innocence has been proven without DNA testing in a case.

[7] National Academy of Sciences, "Strengthening Forensic Science in the United States: A Path Forward," February 2009, p. 5-5

With regard to the second question, the Texas Forensic Science Commission was concerned "about the perceived differences in the understanding of fire indicators between the scientists and engineers who study principles underlying fire indicators, and the state and local professionals who respond to and investigate fires."[8] The Cameron Todd Willingham case – and that of Ernest Willis, who had been originally convicted and sentenced to death based on the same forms of arson evidence, was subsequently exonerated when the state of Texas recognized the evidence as scientifically invalid, and was then compensated for his wrongful conviction based on his actual innocence – highlights that the manner in which some fire evidence had been interpreted in the past to support findings of arson were scientifically invalid and unreliable.

In order for a fire to be deemed incendiary, all accidental causes must first be ruled out. In both cases referenced above, the arson investigators had originally relied on what we now know to be scientifically *disproven* forms of evidence that a fire had been set to establish the guilt of these men. (See *National Fire Prevention Association 921: Guide for Fire and Explosion Recommendations.*) NFPA 921 establishes that the evidence originally believed to indicate "arson" in those cases were actually indicators of extremely hot fires, and not necessarily indicators that an accelerant had been used to start those fires. A panel of fire scientists agreed that the techniques used in both investigations by state expert witnesses "relied on interpretations of 'indicators' that they were taught constituted evidence of arson. While we have no doubt that these witnesses believed what they were saying, each and every one of the indicators relied upon have since been scientifically proven to be invalid."[9] The Innocence Project believes that the scientifically tested and proven NFPA 921 establishes the scientific invalidity and unreliability of the arson evidence relied upon to convict Mr. Willingham.

c) Modern DNA analysis is based on scientific validation, techniques, and quality assurance guidelines originally developed through the Scientific Working Group on DNA Analysis Methods (SWGDAM), composed of lab directors and led by the FBI Laboratory, and published in professional journals of the crime lab community. Why do you rely on DNA even though it does not meet the standards you now recommend for non-DNA forensic sciences?

Modern DNA analysis *does* meet the standards that the Innocence Project is recommending for non-DNA forensic science. Moreover, the standards and guidelines for forensic DNA did not originate with SWGDAM; rather they evolved long before SWGDAM existed, following a substantial federal investment in basic and applied research and the reports of two National Academy of Science committees. Indeed, what distinguishes forensic DNA from the other forensic disciplines which attempt to associate crime scene evidence with a particular person is its genesis. The basic methods of DNA testing were validated for medicine before they were used in criminal cases. The basic methods of testing for the other forensic disciplines which examine impressions or class characteristics have never before been scientifically validated for any purpose.

---

[8] Texas Forensic Science Commission, Report of the Texas Forensic Science Commission Willingham/Willis Investigation, April 15, 2011.

[9] Innocence Project, Report on the Peer Review of the Expert Testimony in the Cases of *State of Texas v. Cameron Todd Willingham* and *State of Texas v. Ernest Ray Willis*, p.3.

In 1994, the passage of the DNA Identification Act established the DNA Advisory Board (DAB).[10] From 1995 to 2000, the DAB created two sets of standards: (1) Quality Assurance Standards for Forensic DNA Testing Laboratories[11] and (2) Quality Assurance Standards for Convicted Offender DNA Databasing Laboratories[12]. These standards covered organization and management, personnel, facilities, evidence control, validation, analytical procedures, equipment calibration and maintenance, reports, review, proficiency testing, corrective action, audits, safety, and use of subcontractor laboratories. The DAB also developed a mandatory audit process that eventually became accreditation standards for all DNA laboratories that are federally operated, receive federal funds, or prepare DNA samples for upload into CODIS. The DAB was able to contribute these important standards by building on two National Academy of Sciences reports, DNA Technology in Forensic Science (1992) and The Evaluation of Forensic DNA Evidence (1996) that offered recommendations for standardizing the application of forensic DNA as well as for the statistical calculations that can be drawn from the data.

The DAB was operational from 1995 to 2000, after which SWGDAM became the authority on forensic DNA regulation.[13] Unlike SWGDAM, however, members of the DAB were appointed by the FBI Director from nominations proposed by the head of the National Academy of Sciences and professional societies of crime laboratory officials.[14] As a result, unlike most SWGs, 25% of the DAB were members of academic institutions, 67% held PhD degrees, and the group included one judge and one bioethicist. In contrast, SWGDAM members are appointed by the Department of Justice.

Lastly, DNA is unique in that forensic science laboratories were forced into compliance with the federal standards that were set for its use. Without following the standards set by the DAB, laboratories not only could not receive federal funding, but could also not upload DNA profiles to CODIS. These two consequences would have had dire implications for local criminal prosecutions and thus hastened national compliance with those federal standards.

Unlike SWGDAM, at least seven SWGs represent forensic disciplines that the NAS found to have lacked scientific validation or were not reliable, and/or were disciplines in which expert testimony extrapolated information that was beyond what could be supported by science. Most of these SWGs were established in the 1990s and survived NIJ reports in 1999 and 2004 on the status and needs of the forensic science community where recommendations were made for the validation of nearly all the major forensic disciplines employed by contemporary crime labs. Despite this, those SWGs – and much of the research sponsored by NIJ in those disciplines over the years – assumed the validity of the disciplines it addressed. This is, in part, why Judge Harry Edwards, Senior Circuit Judge and Chief Judge Emeritus for the U.S. Court of Appeals for the D.C. Circuit and the Co- Chair of the NAS report, called SWGs, "as a general matter, of questionable value"[15] in testimony before the Judiciary Committee. While SWGs are helpful advisory bodies that can provide important practitioner input on the implementation of policies and protocols, as currently constituted and operated, most SWGs do not include a sufficiently robust research expertise in its membership to facilitate the scientific work that must be done.

---

[10] Public Law No: 103-322 (H.R.3355)

[11] Quality Assurance Standards for Forensic DNA Testing Laboratories, Forensic Science Communications, July 2000, Vol. 2, No.3.

[12] Quality Assurance Standards for Convicted Offender DNA Databasing Laboratories, July 2000, Vol. 2, No.3.

[13] SWGDAM.org, History of SWGDAM, available at swgdam.org (last accessed, 8/9/2012).

[14] Public Law No: 103-322 (H.R.3355), Sec. 210303.

We look forward to the day when non-DNA forensic sciences can undergo a similar renaissance through validation research, development of scientific standards by a body of researchers and independent scientists advised by practitioners, and the adoption of these standards by laboratories across the country.

---

[15] *Hearing before the Senate Judiciary Committee on Strengthening Forensic Science in the United States: A Path Forward*, 111th Cong., 1st Session, Testimony of Judge Harry T. Edwards, pp. 3 and 4.

Table 1. Unvalidated and Improper Use of Forensic Science in the DNA Exonerations

The table below presents the types of forensic science problems in the DNA exoneration cases by specific discipline. In 53% of the DNA exonerations cases there was documented forensic science testimony or analysis which was unvalidated, improper, or was withheld from the defense (exculpatory forensic evidence).[16]

Discipline	**Total***	**Unvalidated Science Suggesting Inclusion**	**Improper Testimony/ Analysis**	**Failure to Disclose Exculpatory Forensic Evidence Favorable to the Defense**
Serology	**78**	N/A	76	3
Hair	**79**	38	41	1
DNA	**11**	N/A	10	1
Fingerprints	**5**	0	3	2
Bite marks	7	2	5	2
Other (dog scent, shoe prints, fiber, tire tracks)	**15**	6	9	2

* *Note: numbers across the rows will not always equal the number in the total column, as some cases involved multiple problems across disciplines.*

Definitions of Categories Displayed in Table

- **Improper Testimony or analysis**: testimony or analysis which drew conclusions beyond the limits of science as known at that time (see g/n article for more details of definitions). Also included in this category is where there was negligence in analysis, fabrications/alterations of reports and possible failures to conduct elimination testing or comparison. We do not separate out misconduct, as it is not possible in most cases to know the intent of the witness.
- **Unvalidated testimony or analysis**: discipline that has not been validated and the testimony or analysis suggested a possible inclusion (source is consistent with/similar to/cannot be excluded, etc).
- **Failure to disclose exculpatory forensic evidence**: withholding laboratory reports, analysis, or data, or the very existence of evidence.

---

[16] The percentage of cases involving unvalidated/improper forensic science is 52% when excluding the cases where exculpatory forensic evidence was not turned over to the defense (n=11).

PETER NEUFELD
ANSWER IN RESPONSE TO SENATOR AMY KLOBUCHAR
QUESTIONS FOR THE RECORD
SENATE JUDICIARY COMMITTEE HEARING ON
"IMPROVING FORENSIC SCIENCE IN THE CRIMINAL JUSTICE SYSTEM"

Question for Peter Neufeld

Many people in the criminal justice system have identified what has come to be known as the "CSI effect"—that is, where jurors expect sophisticated scientific evidence because that is what they have seen on TV shows like CSI.

I know from my time as a prosecutor that forensic evidence is not available in many run-of-the-mill cases. These cases—such as auto theft or assault cases—often do not yield any forensic evidence. Can you comment on this? Is there a way to counter the unrealistic expectations that juries may have developed in recent years?

ANSWER:

Your questions reveal two serious challenges that prosecutors face – ones that we are sensitive to given our work helping them convict the real perpetrators of crime post-exoneration. First, when no forensic evidence is available, prosecutors need to explain to skeptical juries that unlike what they see on *CSI*, forensic evidence is not present in all cases. Second, when forensic evidence is present, prosecutors must deal with television programs that wildly exaggerate and glorify forensic science, and thereby create unrealistic expectations among jury panels. While little can be done when forensic evidence is unavailable (although we have learned anecdotally that prosecutors can effectively make this point to jurors), we believe that prosecutors would greatly benefit from the public having increased confidence in the reliability and accuracy of forensic science. Nationally-accepted standards, which quantify the probative value of specific forensic techniques, will eliminate any misconceptions and doubts about (and unfounded assurance in) the reliability of forensics among juries.

Since the police officers, lawyers and judges who are tasked to adjudicate these cases are very rarely forensic specialists themselves, properly understanding forensic scientific evidence presents a challenge that demands a fix before scientific evidence reaches the courtroom. Before the evidence is presented to the courts – or even before police use such testing for determining the course of their investigations – the scientific method should be applied to each forensic assay or technology and parameters for report writing and proper testimony should be established.

In Minnesota, the shuttering of the St. Paul Police Department Crime Laboratory's drug unit illustrates the consequences of not having national science-based standards. Without national standards as a basis for testing and reporting, the problems in St. Paul have thrown thousands of drug cases into question[1] and strained the limited resources of the

---

[1] MPR.org, *Prosecutor offers plea deals due to crime lab questions*, available at http://minnesota.publicradio.org/display/web/2012/07/31/news/stpaul-crime-lab-convictions-in-question/ (last accessed, 8/2/2012).

State.[2] Science-based forensic standards will allow law enforcement to effectively use forensic tools and will prevent attorneys from introducing faulty expert testimony, while still encouraging attorneys and law enforcement to advocate for victims. Additionally, they will strengthen criminal prosecutions, protect the victims, and decisively enhance the evidentiary tools available to prosecutors and make the strongest possible cases against the real perpetrators of crime.

---

[2] Twincities.com, *St. Paul crime lab: County attorneys will have state lab retest all pending cases*, available at http://www.twincities.com/localnews/ci_21211098/st-paul-crime-lab-county-attorneys-will-have (last accessed, 8/2/2012).

CFSO
Consortium of
Forensic Science Organizations

American Academy of Forensic Sciences
American Society of Crime Laboratory Directors
American Society of Crime Laboratory Directors.
Laboratory Accreditation Board
International Association for Identification
Society of Forensic Toxicologists
American Board of Forensic Toxicology
National Association of Medical Examiners

August 9, 2012

Halley Ross
Hearing Clerk, Senate Judiciary Committee
United States Senate
Committee on the Judiciary
Washington, DC 20510-6275

Subject: Hearing-"Improving Forensic Science in the Criminal Justice"

Dear Ms. Ross:

Please find attached answers to questions from Committee members resulting from the Justice hearing entitled "Improving Forensic Science in the Criminal Justice" on July 18, 2012.

Again, the Consortium of Forensic Science Organizations was honored to testify at the hearing and be a part of this very important process.

Should you have any questions or need additional information, I can be reached at [redacted] or [redacted].

Sincerely,

Jill L. Spriggs
Secretary
Consortium of Forensic Science Organizations
ASCLD President

Senator Al Franken Questions and Answers

1) How many public crime labs are there in the United States?

There are approximately 400 public crime labs in the United States (Federal, State, and Local).

2) How many private crime labs are there in the United States?

The number of private crime labs could not be found.

3) How many of the public crime labs are accredited?

Approximately 332 public crime labs are accredited.

4) How many of the private crime labs are accredited?

Approximately 44 private crime labs are accredited.

5) Of the public crime labs that are accredited, how many are accredited in accordance with the ISO/IEC 17025:2005 or a higher standard?

Approximately 232 public crime labs are ISO accredited.

6) Of the private crime labs that are accredited, how many are accredited in accordance with the ISO/IEC 17025:2005 or a higher standard?

Approximately 34 public crime labs are ISO accredited.

7) Why do you believe that ISO/IEC 17025:2005 is an appropriate accreditation standard?

The ISO/IEC 17025: 2005 document used is comprised of over 400 standards. The ISO Standards are internationally recognized standards commonly used by many different entities such as pharmaceutical and environmental laboratories. Quality is paramount under ISO with an intensive focus on management and cradle to grave documentation. To become accredited under this standard each Laboratory needs to prepare a robust Quality Management System comprised of:

- **Quality Manual**
- **Procedure Manuals**
- **Training Manuals**
- **Laboratory Operations Manual**
- **Technical and Corrective Action Procedures**
- **Laboratory Information Management System Manual**
- **Normative References**

- **Proficiency Testing**

ISO accreditation gives customers and stakeholders confidence in the casework performed, comprehensive documentation, constructive communication, improved record keeping, better transparency and consistency and a high accountability to an external international authority. In the end, crime laboratories will have a concise, efficient, streamlined crime lab system devoted to quality, increased accountability and faster responses to questions due to policies and documentation.

In addition, there are supplemental standards issued by the accreditation body that performs the assessment or audit. Not only are the crime labs assessed to the over 400 ISO standards but they are also assessed to the supplemental standards.

For more information, please see the following websites:

http://www.ascld-lab.org/

http://www.fqsforensics.org/

Senator Amy Klobuchar Questions and Answers

In your testimony, you mentioned that "(m)any of our crime laboratories are drowning in synthetic drug cases," and that the largest backlog in crime labs is in controlled substances. Please expand on that point. What issues are you seeing in the area of synthetic drugs?

> **Since 2010 crime laboratories have seen a marked increase in the number of controlled substances cases containing new synthetic drugs such as synthetic cannabinoids and "research chemicals" or "bath salts." Recently, laboratories have witnessed the largest increase of new drug substances than has been encountered in the past 20 years. Many samples encountered in the laboratory contain mixtures of these new substances.**
>
> **Many of the synthetic drugs are similar in chemical structure. Differentiating closely related substances is difficult until reference materials become available. Additionally, many labs may require new instrumentation to aid in this differentiation and identification. In an effort to remain legal, as certain substances are controlled, they are modified to maintain their pharmacological activity, but to change the chemical structure enough to not fall into current legislation.**
>
> **New synthetic drugs have increased the complexity of both analysis and reporting in controlled substances cases, which has negatively impacted case backlogs.**
>
> **Backlogs of controlled substances have consisted of traditional drug cases such as marijuana, cocaine, heroin and methamphetamine, etc... In 2005, a Bureau of Justice Statistics (BJS) Survey highlighted that *"controlled substance identification accounted for about half of all requests backlogged at year end"*. Data from a 2009 BJS survey (recently released 8/2/2012) showed that requests for the controlled substance discipline was:**
>
> - **The most requested test by evidence submitters (e.g., law enforcement agencies).**
> - **The most common forensic function performed by all publicly funded forensic crime labs.**
> - **And had the second most backlogged type of request.**
>
> **These reports objectively support the argument that the problem of untested, traditional, drug evidence existed in many crime laboratories prior to 2009. However, what these reports do not illustrate is the recent phenomenon of "synthetic drugs" submissions.**

In 2009, the synthetic drugs (e.g., Spice and Bath Salts, etc...) were not considered a major testing category by most crime laboratories. Indeed, a 2010 NFLIS (National Forensic Laboratory Information System) estimates that only 15 of these types of drugs were identified in the United States in 2009. However, this soon increased to 2977 submissions in 2010.

The State of Utah had a similar experience. The Utah Bureau of Forensic Services had no "synthetic" drug submissions in 2009, a few in 2010 but by the end of 2011, these types of drugs accounted for one fourth of all drug submissions to their crime laboratory system. Other crime laboratories around the country are experiencing a similar trend.

As stated in my testimony despite these challenges with synthetic drugs, as well as other tradition drugs, the federal funds for forensics do not reflect this ever-increasing problem. It is one of the reasons that we believe strongly that grant reform is needed and an analysis must be done of the needs of the forensic practitioners and then budgets must reflect those needs. In other words, a national strategy for forensics must be documented and addressed on a yearly basis.

Synthetic drugs have special challenges. The following is a list of issues that Utah and other laboratories have experienced:

Issue #1 – Analog law/Current Federal Law

Most Prosecutors are unwilling to prosecute cases where the active compound is not specifically listed within the law. Many of the "spice/bath salt" chemicals identified are not added to the controlled substance schedule for more than a year after the crime lab first begins to see them in submissions. Some of these new, identified compounds may not be considered analogs and do not fall into a class of substances that can be considered scheduled under the new law.

Issue#2 – Binding Site Studies

Even if a submission could be pursued under the analog act or the new federal law there is insufficient scientific studies to prosecute them under these laws. If the laws are to stay the same then a method of temporally scheduling them needs to be developed to put a stop to the illegal use of these compounds, until sufficient studies can be performed.

Issue #3 – Changing Active Compounds

By the time the "spice/bath salt" draws the attention of the legislature, the manufacturers and distributers change to another compound. Most of the compounds are simply a minor change to the structure of the molecule (e.g., change

hydrogen to a chlorine atom). Additionally, the "brands", marketed in convenience and smoke shop stores, typically change the compounds that are added to the plant material used in "spice", which are almost universally Damiana leaves mixed with some other plants. This means that criminal justice agencies can have no guarantee that a particular "brand" will contain a particular compound. Hence, every sample must be tested.

Issue #4 - Lack of Data for Identification

The manufacturers frequently change the compounds in their "spice/bath salt" products. This practice results in new, time-consuming "research projects" for crime laboratories which greatly increases the analysis and backlog time. Few current "synthetic drug" libraries exist that are useful and those that do are very expensive. Furthermore, the ones that are current come with the *"caveat"* that they should not be used for identification or used to confirm a standard which makes them less useful for most crime laboratory purposes.

Issue #5 – Lack of Good Quality Standards

There are very few providers of quality standards and those manufacturers will only begin producing standards when there is sufficient demand. Without good quality standards, laboratories will need more sophisticated and expensive identification methods (e.g., Nuclear Magnetic Resonance Spectroscopy) to supplement their current instrumentation.

Issue #6 – Lack of Color Tests or Testing Methods

Most accredited, public forensic crime labs follow the national SWGDRUG (Scientific Working Group for the Analysis of Seized Drugs) guidelines. Those guidelines recommend at least two (2) methods of testing which means laboratories need a reliable color test; however, one does not exist for most "spice/bath salt" compounds. The other option for laboratories is to invest in more diverse and expensive types of analytical equipment with both separation and identification capability (e.g., GC/MS, LC/MS, etc...).

Issue #7 – Lack of a Field Test

Crime laboratories are being inundated with these types of cases because there are no screening tests for officers to determine what substance they may have – similar to a quick field test kit for cocaine or methamphetamine. Left with no other choice prior to filing criminal charges, these cases are submitted to the crime laboratory. Because there are hundreds of possible substances that could be in these synthetic

drug products, the analysis time of each item of evidence is approximately double to triple the analysis time of a single bag of cocaine, for instance.

Senator Charles Grassley Questions and Answers

1) Can you please explain what a crime laboratory has to do to become accredited under current standards? Could new accreditation standards add anything to that?

ISO accreditation is important to the public and criminal justice system. It demonstrates a crime laboratory is performing at the highest standard of quality. Without ISO accreditation, the laboratory will not be able to apply for federal grants or participate in the Combined DNA Index System (CODIS). DNA cases will go unsolved and violent criminals will remain on the street.

ISO accreditation requires documentation and oversight, along with annual surveillance visits followed by a full assessment every five years.

The average time it takes for a crime laboratory to prepare for an ISO accreditation assessment/inspection is approximately three years. During this time, manuals are written and re-written to reflect all 400 standards under ISO 17025:2005. A crime laboratory must show six months of actual working experience and knowledge of its Quality Management System comprised of: Procedures Manuals, Training Manuals, and a Quality Manual. Of equal importance are the crime laboratories: testimony monitoring, equipment calibration, proficiency testing, corrective action plan, validation and report writing. After this is accomplished, a laboratory must apply for an assessment/inspection and receive a date in which the assessment/inspection team will arrive. Each assessment takes approximately one week to complete. A Lead Assessor/Inspector will lead the team of assessors/inspectors through the assessment process. For an average size crime laboratory of 30 employees, the total number of assessors inspecting the laboratory is approximately seven assessors. Assessors are trained individuals who are qualified and knowledgeable in the discipline they are inspecting. During the week long assessment, assessors will look at casework to determine if case notes support the conclusions, inspect equipment maintenance logs, view chain of custody records of casework, review proficiency test records, perform an assessment of the security of the laboratory and determine if the laboratory has a correction action plan in place. Most assessors/inspectors work twelve hour days to accomplish this task. Once the assessment is complete, the laboratory will receive Corrective Action Requests (CARs) and must follow up on any issues found before they can be accredited.

Not only are crime laboratories assessed to ISO standards but they are also assessed to supplemental standards issued by the accrediting body that performs the assessment or audit.

Although, the ISO standards themselves are not updated routinely, the supplemental standards are updated on a routine basis by the accrediting body. As I indicated in my testimony, both ISO and supplemental standards should evolve and advance as the science does.

2) Please describe current standards for certification of lab analysts-who sets them, what it takes to get certified, what continuing oversight exists. What more can be done regarding certification?

Currently there are several certification bodies. All certifications at the moment are a voluntary process for most states.

American Board of Criminalistics (ABC)

The American Board of Criminalistics was formed by a majority of forensic science associations such as ASCLD to establish a certification process. All ABC examinations are three hours in length and consist of 220 multiple choice questions. Questions are drawn from areas of law, safety, ethics and all disciplines in a crime laboratory. Once a general examination is passed, a Criminalist can go on to take a specialty examination such as drug analysis or molecular biology.

There are two types of ABC certification: Diplomate and Fellow. A Diplomate is awarded to individuals with a BS/BA in a natural science, two years of forensic lab or teaching experience and upon successful completion of an ABC examination. This designation is designed for people who no longer do casework such as lab directors, supervisors and educators. A Fellow is awarded to successful completion of any of the ABC examinations, successful performance on proficiency tests and a minimum of two years in a specialty area. The ABC Fellow certificate signifies that the analyst is qualified to conduct examinations in the specialty area.

The certification is valid for 5 years. One can be recertified by continued participation in the field of forensics sciences through training, casework, publishing, etc.

More information can be found at http://www.criminalistics.com/.

Association of Firearm and Tool Mark Examiners (AFTE)

The Association of Firearm and Tool Mark Examiners (AFTE) offers external certification examinations to qualified AFTE Members.

In 1998, AFTE worked in conjunction with Cooperative Personnel Services (CPS) to develop certification examinations in three different competency areas: firearm, gunshot residue, and tool mark evidence examination and identification. Each certification examination consists of a written examination and a practical

examination. The tests were reviewed by a panel of twelve subject matter experts to ensure relevance and clarity of the written portion of the test.

To qualify for the test, an individual must be a regular, distinguished or emeritus member of AFTE; have training and experience equivalent to the course of study described in the AFTE Training Manual; have 3 years of experience as a court qualified firearm and tool mark examiner with training and experience equating to 5 years of total experience in the discipline; and must possess an earned baccalaureate degree from an accredited academic institution with major course work in physical science, natural science, forensic science, criminalistics, criminal justice, police science, industrial technology or related fields of study.

An individual must be recertified every five years. To maintain certification, the participant is required to successfully complete a proficiency test annually in each area that they are certified. In addition to working in the forensic sciences, the applicant must have earned 100 Continuing Education Units (CEUs) for training received and 50 CEU's for training provided during the five years since becoming certified or being recertified.

In 2012, AFTE worked in conjunction with the National Forensic Science Technology Center (NFSTC) to develop the AFTE Certification On-Line written test.

Complete information about the AFTE Certification Examination can be found at:
http://www.afte.org/AssociationInfo/a_certification.htm

International Association of Identification (IAI)

IAI certifies examiners in various programs such as latent prints, footwear, crime scenes, bloodstain pattern examination, ten print fingerprint certification, etc.

The latent print certification is an extremely arduous process. The requirements for IAI Latent Print Certification is as follows:

A. Technical Training Required:

Minimum of 80 Hours of Certification Board approved training in latent print matters, along with criteria listed on the application form. It should be noted that for Certification, hours will be used to calculate figures and credits used to calculate recertification figures.

B. Basic Experience Required:

1. Minimum of two (2) years full-time experience in the comparison and identification of latent print material and related matters.
2. If less than full-time experience for the given time period is possessed, times must be accumulated to reach an acceptable minimum.

C. Education Requirements:

1. A Bachelor's Degree plus two (2) years full-time experience as prescribed by the LPCB.

   or

   a. An Associate Degree (or documentation of 60 semester hours or 90 quarter hours of college credits) plus 3 years full-time experience as a latent print examiner equals the Bachelor's Degree requirement.

      or

   b. Four (4) years full-time experience as a latent print examiner required by Section C, 1 equals the Bachelor's Degree requirement.
2. Educational requirements are not applicable to re-certification.

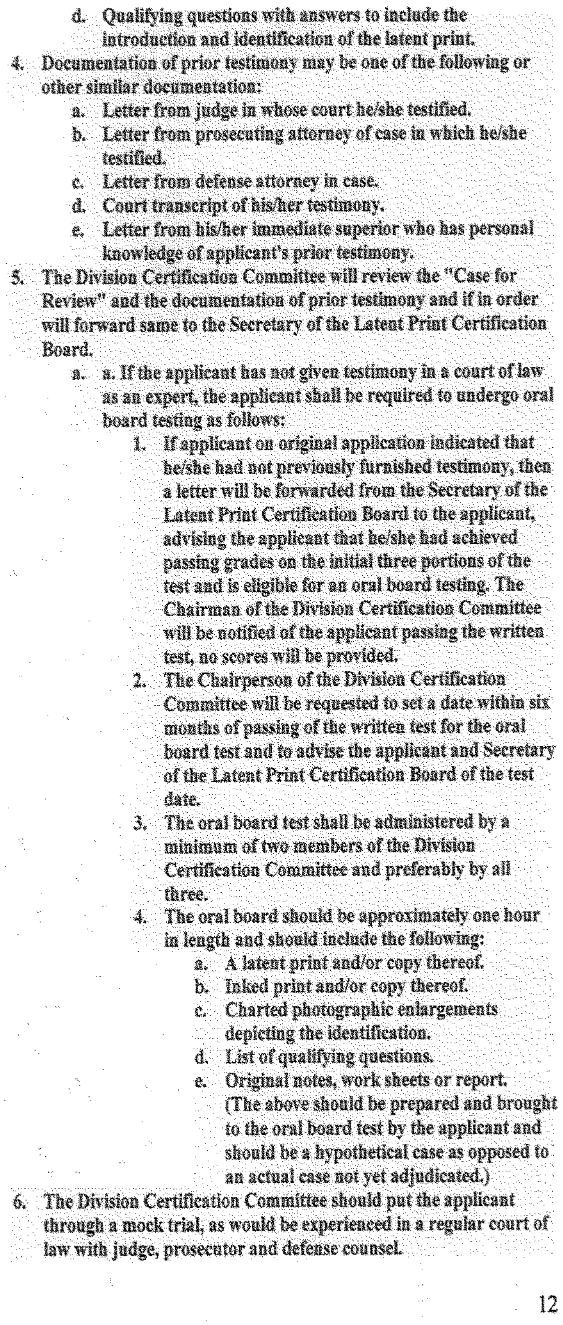
D. Examinations:

Certification shall be determined by testing. The certification test was developed and is maintained by the IAI Latent Print Certification Board. The applicants have 8 hours to complete parts 1, 2, and 3 of the test. All written tests are graded and recorded on a pass/fail basis as follows:

1. Comparison of 15 latent prints with inked prints. The applicant must correctly identify a minimum of 12 of the latent prints without an erroneous identification.
2. Pattern Interpretation of 35 Inked Impressions. The applicant must correctly interpret a minimum of 32 prints.
3. True and false, multiple choice questions relative to the history of fingerprints, pattern interpretation and latent prints. Must successfully pass a written test with a minimum score 85%.

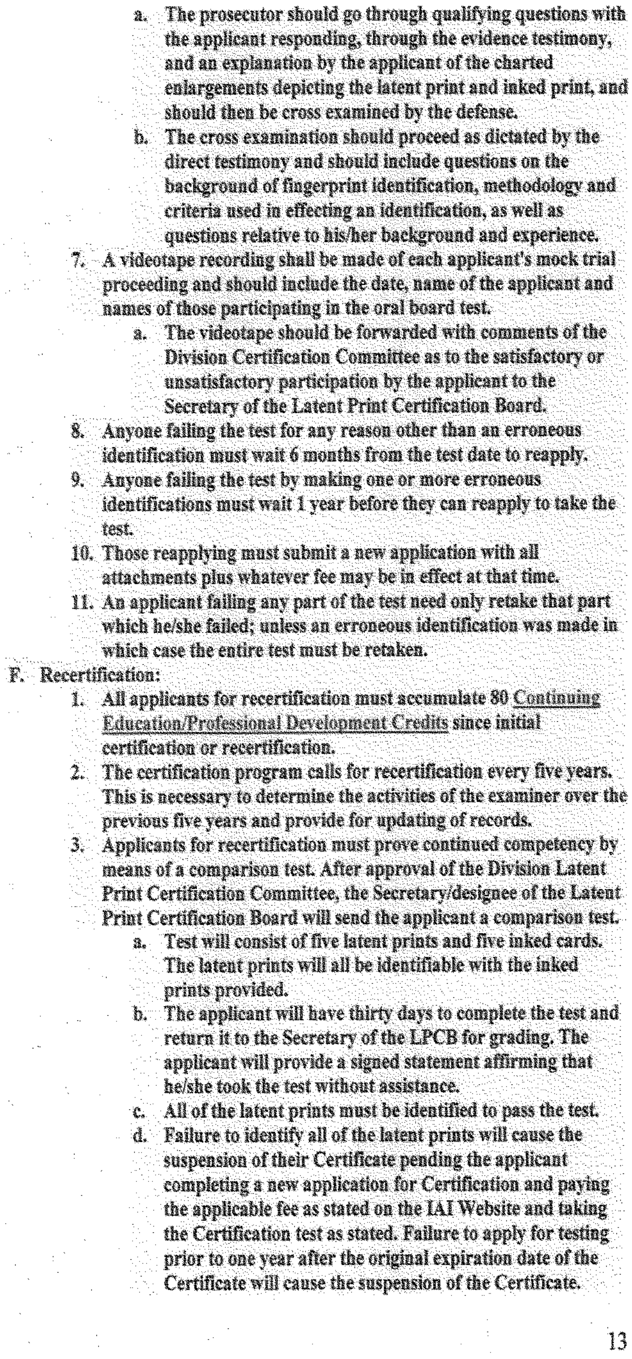
E. Either oral board testing and/or presentation of a case for review to include latent print, inked print, charted enlargements and court qualifying questions and answers.

1. If the applicant has already testified in a court of law as an expert, the applicant may submit a case for review, or may submit to the oral board testing.
2. If the applicant for certification indicated on the original application that he/she had previously testified in a court of law to a latent print identification, the letter will specify a 90 day time limit by which the applicant must submit to the Division Certification Committee a case for review and documentation of prior testimony.
3. The case for review shall include:
   a. A copy of the latent print
   b. A copy of the inked print
   c. Charted photographic enlargements of a and b, and include an explanation on how the conclusion is reached.



- d. Qualifying questions with answers to include the introduction and identification of the latent print.

4. Documentation of prior testimony may be one of the following or other similar documentation:
   - a. Letter from judge in whose court he/she testified.
   - b. Letter from prosecuting attorney of case in which he/she testified.
   - c. Letter from defense attorney in case.
   - d. Court transcript of his/her testimony.
   - e. Letter from his/her immediate superior who has personal knowledge of applicant's prior testimony.
5. The Division Certification Committee will review the "Case for Review" and the documentation of prior testimony and if in order will forward same to the Secretary of the Latent Print Certification Board.
   - a. a. If the applicant has not given testimony in a court of law as an expert, the applicant shall be required to undergo oral board testing as follows:
     1. If applicant on original application indicated that he/she had not previously furnished testimony, then a letter will be forwarded from the Secretary of the Latent Print Certification Board to the applicant, advising the applicant that he/she had achieved passing grades on the initial three portions of the test and is eligible for an oral board testing. The Chairman of the Division Certification Committee will be notified of the applicant passing the written test, no scores will be provided.
     2. The Chairperson of the Division Certification Committee will be requested to set a date within six months of passing of the written test for the oral board test and to advise the applicant and Secretary of the Latent Print Certification Board of the test date.
     3. The oral board test shall be administered by a minimum of two members of the Division Certification Committee and preferably by all three.
     4. The oral board should be approximately one hour in length and should include the following:
        - a. A latent print and/or copy thereof.
        - b. Inked print and/or copy thereof.
        - c. Charted photographic enlargements depicting the identification.
        - d. List of qualifying questions.
        - e. Original notes, work sheets or report. (The above should be prepared and brought to the oral board test by the applicant and should be a hypothetical case as opposed to an actual case not yet adjudicated.)
6. The Division Certification Committee should put the applicant through a mock trial, as would be experienced in a regular court of law with judge, prosecutor and defense counsel.



  - a. The prosecutor should go through qualifying questions with the applicant responding, through the evidence testimony, and an explanation by the applicant of the charted enlargements depicting the latent print and inked print, and should then be cross examined by the defense.
  - b. The cross examination should proceed as dictated by the direct testimony and should include questions on the background of fingerprint identification, methodology and criteria used in effecting an identification, as well as questions relative to his/her background and experience.
7. A videotape recording shall be made of each applicant's mock trial proceeding and should include the date, name of the applicant and names of those participating in the oral board test.
  - a. The videotape should be forwarded with comments of the Division Certification Committee as to the satisfactory or unsatisfactory participation by the applicant to the Secretary of the Latent Print Certification Board.
8. Anyone failing the test for any reason other than an erroneous identification must wait 6 months from the test date to reapply.
9. Anyone failing the test by making one or more erroneous identifications must wait 1 year before they can reapply to take the test.
10. Those reapplying must submit a new application with all attachments plus whatever fee may be in effect at that time.
11. An applicant failing any part of the test need only retake that part which he/she failed; unless an erroneous identification was made in which case the entire test must be retaken.

F. Recertification:

1. All applicants for recertification must accumulate 80 Continuing Education/Professional Development Credits since initial certification or recertification.
2. The certification program calls for recertification every five years. This is necessary to determine the activities of the examiner over the previous five years and provide for updating of records.
3. Applicants for recertification must prove continued competency by means of a comparison test. After approval of the Division Latent Print Certification Committee, the Secretary/designee of the Latent Print Certification Board will send the applicant a comparison test.
  - a. Test will consist of five latent prints and five inked cards. The latent prints will all be identifiable with the inked prints provided.
  - b. The applicant will have thirty days to complete the test and return it to the Secretary of the LPCB for grading. The applicant will provide a signed statement affirming that he/she took the test without assistance.
  - c. All of the latent prints must be identified to pass the test.
  - d. Failure to identify all of the latent prints will cause the suspension of their Certificate pending the applicant completing a new application for Certification and paying the applicable fee as stated on the IAI Website and taking the Certification test as stated. Failure to apply for testing prior to one year after the original expiration date of the Certificate will cause the suspension of the Certificate.

e. An erroneous identification will cause the suspension of their Certificate for one year. After one year the applicant may apply for Certification and be tested as stated.

G. Final Review:

1. The Secretary of the Latent Print Certification Board will review the application and all related material including all test material, case for review, documentation of prior testimony, tape of mock trial and recommendations of the Division Certification Committee. If everything is acceptable, a certificate and certification card will be issued to the applicant.
2. The entire Latent Print Certification Board will review the application and all related material in the event there is a technical concern about the application or test results.

Note: All information highlighted in yellow was taken directly from the IAI website.

Additional information can be found on the website for other areas of certification at http://www.theiai.org/certifications/

For all certifications, an evaluation of the education, training and continuing education of analysts should be performed by accrediting agencies during evaluation of forensic laboratories. Additional accreditation requirements should be in place to ensure analysts have the proper education, certification, and annual training hours.

3) Can you please explain the roles and responsibilities of the Scientific Working Groups that currently set standards for the various forensics science disciplines? What is missing from the SWG process now?

As I indicated in my testimony, the federal government took a leadership role in creating technical working groups consisting of federal, state and local forensic scientists, international members, academia and independent consultants. One of the most visible groups is the Scientific Working Group on DNA Analysis Methods or SWGDAM. The role of this group is to ensure the uniformity of DNA standards and improve processes within the forensic human DNA laboratory community.

Each discipline in forensic science also has a similar SWG group. For example, the Scientific Working Group for Seized Drugs or SWGDRUG and Scientific Working Group for Friction Ridge Analysis, Study and Technology or SWGFAST. For example, the mission of SWGDRUG is to recommend minimum standards for the forensic examination of seized drugs and to seek their international acceptance (http://www.swgdrug.org/index.htm). All eighteen SWG groups have the same interest at heart, which is to create a forum for increased quality in the discipline they represent. In other words, all SWG groups provide guidelines to the scientific community it represents by providing guidance on such topics of validation, report writing, education, training, proficiency testing, equipment calibration and interpretation of data.

However, these other disciplines within the field of forensic science have not enjoyed such robust and widespread federal support as the DNA analysis Scientific Working Group. SWGDAM is funded by the Federal Bureau of Investigation while the other SWG groups receive very little funding at all resulting in an orphan status as compared to SWGDAM. In addition, some SWG groups are not as organized in their approach of issued standards as SWGDAM. Guidance and leadership is needed to provide all SWGS with the necessary tools to become an effective and positive influence in the forensic community.

In addition, the SWGs need to be provided clear direction and expectations for the type of work product members are to produce. A criticism of the SWGs is that the work being produced is not in line with the type of work that needs to be produced to answer the criticisms of the forensic sciences (such as those in the NAS Report). Without clear direction, the SWGs will continue to produce work product that they see as relevant, which may not be in line with what is valued by those that are trying to evaluate the forensic disciplines but may be in line with the forensic community.

Additional information regarding funding for each SWG can be found at: http://www.nij.gov/topics/forensics/lab-operations/standards/scientific-working-groups.htm#notnijfunded

As an example- As stated on the website, the roles and responsibilities of the Scientific Working Group for Firearms and Toolmarks (SWGGUN) is "*...to develop a series of consensus guidelines for the firearm and toolmark discipline and to disseminate SWGGUN guidelines, studies, and other findings that may be of benefit to the forensic community.*" The objectives of the SWGGUN are also present on the website:

1. **Recommend and disseminate discipline guidelines for quality assurance and quality control.**
2. **Provide guidelines and not to mandate decisions of policy.**
3. **Discuss, share and exchange ideas regarding forensic analysis methods, protocols and research.**
4. **Bring together organizations and/or individuals actively pursuing relevant analysis methods for the purpose of exchanging and disseminating information.**
5. **Cooperate with other national and international organizations in developing relevant standards.**
6. **Monitor and disseminate research and technology related to the discipline.**

Currently, the SWGGUN does not set standards for the forensic science discipline of firearm and toolmark examination or have a direct mechanism to enforce its guidelines. A stable source of funding and administrative support would allow the SWGGUN to more effectively produce guidelines and resources.

The work product of the SWGGUN is valuable and relevant to the forensic firearm and tool mark community. With the presence of AFTE, the SWGGUN has taken the role of developing guidelines, responding to criticisms of the science, and developing tools (Admissibility Resource Kit) that are useful to those in the discipline. Further, in recent years SWGGUN has been active in educating the firearm and toolmark discipline by providing admissibility training to various agencies. The developed work product is intended for use by practitioners in the discipline, and as such, may not fulfill the needs of the federal government or the greater forensic science community.

4) Can you please describe in more detail the Australian NIFS and what features of its operations would be beneficial, if they could be transferred to the United States and our legal system?

As indicated in my testimony, the National Institute of Forensic Science (NIFS) is model the United States could subscribe in order to provide guidance and leadership to the forensic community.

NIFS was established with sign off by both Federal and State Governments so there is national buy in across government. It has established strong ties and interfaces with the forensic science community, end user groups (justice and policing) and academia with representation at the highest level of all of these stakeholders on the Board and/or its Advisory Forum.

NIFS works on a daily basis with Specialist Advisory Groups (SAGs) (8 of them) which cover the broad range of disciplines within the forensic sciences. It develops Annual Action Plans with the SAGs which identify and prioritize work plans to resolve pressing technical and scientific needs.

NIFS also works very closely with the Senior Managers of Australian and New Zealand Forensic Laboratories (SMANZFL), the ASCLD equivalent, on management/policy issues.

For both SMANZFL and the SAGs it acts as a body for knowledge and technology transfer through an annual workshop program.

NIFS is small, nimble and flexible. It has a coordinator and facilitator. Through its engagement at all levels across its stakeholder groups it has developed enormous good will which assists in obtaining national consensus. This has assisted in reaching national agreement on issues such as Standards, accreditation, certification, R&D and education and training.

Additional information can be found at the following website: http://www.nifs.com.au/home.html

5) Can you please describe the current state of research on the validity of fingerprinting?

In an August 2009 position statement regarding the NAS report, *Strengthening Forensic Science in the United States: A Path Forward,* SWGFAST maintained that a significant body of constructive scientific research has already been conducted that addresses some of the concerns expressed in the report.

Since that time additional research has been ongoing throughout the world which addresses the science of friction ridge identification. Some of that research has been published and/or reported on to the community, while some remains in progress. In November 2011, SWGFAST provided a 64 page response to a request from the Research, Development, Testing & Evaluation Inter-Agency Working Group of the National Science and Technology Council, Committee on Science, Subcommittee on Forensic Science asking for an annotated bibliography of the literature supporting the friction ridge sciences. This report (see attached/available at http://www.pdfdownload.org/pdf2html/pdf2html.php?url=http%3A%2F%2Fswgfast.org%2FResources%2F111117-ReplytoRDT%26E-FINAL.pdf&images=yes) was prepared on behalf of SWGFAST by a dedicated task force established at the University of Lausanne (Forensic Science Department of the Faculty of Law and Criminal Justice) under the direction of SWGFAST member Dr. Christophe Champod. Included within the report are publications covering the areas of: underlying fingerprint characteristics, minutiae sample sufficiency, fingerprint quality, fingerprint matching, type I and type II error, probability, analyst consideration, and end to end process reliability. I have also attached a copy of this for your review. (See Attachment #1)

Considering the current question, SWGFAST would bring particular attention to those publications highlighted in Appendix A which is a latent print *Daubert* direct reference list used by latent print examiners from the FBI Laboratory Division.

Since the issuance of the NAS report the National Institute of Justice has issued thirteen awards to address friction ridge research (see Appendix B, accessed August 7, 2012, http://www.nij.gov/topics/forensics/forensic-awards.htm#impressionaccessed). While many of the awards have yet to be fulfilled through publication of final reports the interest and support reveals a strong commitment to continued research in the field.

In addition, attached is a consensus document representing work from IAI members in 2006-2008, reference literature and international surveys to support this effort. Included in the summary are recommendations suggested by a cross section of the fingerprint community to include domestic and international representatives. As a result, a new resolution was approved by the membership. Both the report and resolution are attached. (See Attachments #2 and #3)

Again, the problem lies in the fact there is a lack of a national roadmap of what is needed and further-- once research is done there is no method by which to distribute it to the community and all stakeholders.

6) Can you please describe that study? What is the current state of research overall on the validity of firearms matching?

The research that has been performed to establish the validity of the forensic firearm and tool mark discipline has been compiled as part of the SWGGUN Admissibility Resource Kit (www.swggun.org). Numerous research projects have tested the fundamental propositions of the forensic firearm and tool mark discipline, resulting in the establishment and continued support of the AFTE Theory of Identification.

In response to questions posed by the Subcommittee on Forensic Science's Research, Development, Testing & Evaluation Interagency Working Group (RDT&E IWG), the SWGGUN compiled a list of annotated bibliographies of the foundational research performed in the forensic firearms and tool marks discipline. The list is 47 pages in length, and can be found on the SWGGUN website.

http://www.swggun.org/swg/index.php?option=com_content&view=article&id=51:swggun-responds-to-sofs-request&catid=13:other&Itemid=43

Much of the emerging research is focused on the development of instrumentation to map the topography of a tool mark, to capture the image of the tool mark using an advanced technology, or develop a statistical assessment as to the likelihood that two tool marks were produced using the same tool. By removing the examiner from the comparison process, much of this research is attempting to establish a more objective standard for association statements.

International Association for Identification
2010 Resolutions And Legislative Committee

Deborah A. Leben, Chairperson
United States Secret Service
950 H Street NW, FSD
Washington, DC 20223-0002

Phone: (202) 406-5269
Fax: (202) 406-5656
E-Mail: deborah.leben@theiai.org

RESOLUTION 2010-18

As amended from the floor

WHEREAS, the members of the International Association for Identification assembled at their 95th International Educational Conference in Spokane, Washington on July 16, 2010 wish to change the official position of the Association related to Friction Ridge Examinations based on advances in the science and scientific research, **and**

WHEREAS, the members wish to acknowledge the need for continual research on new and innovative methods and the application thereof, **and**

WHEREAS, The Standardization II Review Committee was created and had been charged with the responsibility of reviewing Resolution 1979-7 and of 1980-5. The IAI recognizes that the testimony and reporting restrictions which had been enacted in good faith in Resolution 1979-7 and 1980-5 are not consistent with advancements since their passage.

They read in part as follows:

> Resolution 1979-7:
>
> "***THEREFORE BE IT RESOLVED*** that any member, officer or certified latent print examiner who provides oral or written reports, or gives testimony of possible, probable or likely friction ridge identification shall be deemed to be engaged in conduct unbecoming such member, officer or certified latent print examiner as described in Article XVII, Section 5, of the constitution of the International Association for Identification, and charges may be brought under such conditions set forth in Article XVI, Section 5, of the constitution. If such member be a certified latent print examiner, his conduct and status shall be reconsidered by the Latent Print Certification Board…."
>
> Resolution 1980-5: (Amending Resolution 1979-7)
>
> "***THEREFORE BE IT RESOLVED*** that any member, officer or certified latent print examiner who **initiates or volunteers** oral or written reports, **or testimony** of possible, probable or likely friction ridge identification, **or who, when**

required in a judicial proceeding to provide such reports or testimony, does not qualify it with a statement that the print in question could be that of someone else, shall be deemed to be engaged in conduct unbecoming such member,…"

Therefore be it

***RESOLVED* that,** based upon the results of a multi-year study by the Standardization II Review Committee, the IAI hereby recognizes the following:

1. For over a century, the examination and comparison of human friction ridge skin impressions have been used to determine the specific source of those impressions.
2. The practice of this form of comparative analysis by trained and competent examiners has been shown, through experience and study, to be reliable with rare occurrences of error.
3. This reliability and extremely low occurrences of error have afforded friction ridge skin evidence a high degree of value and importance when used in the forensic arena.
4. It is the responsibility of forensic experts to offer a clear and unambiguous presentation of their conclusions.
5. Friction ridge skin impressions can display varying levels of commonality (pattern type, ridge flow) in appearance with other impressions which do not derive from the same source.
6. Friction ridge skin impressions can share class characteristics (pattern type, ridge flow) and any associations based on these criteria require, ethically and professionally, that the examiner clearly state any limitations of their conclusions.
7. The use of mathematically based models to assess the associative value of the evidence may provide a scientifically sound basis for supporting the examiner's opinion. Examiners shall only use mathematically based models that have been accepted as valid by the IAI in partnership with the relevant scientific community and in which they have been trained to competency.
8. Mathematically based models may not be used as the sole determinant when concluding that friction ridge impressions share a common source. The use of mathematically based models does not relieve the examiner of responsibility for their expert opinion.

Due in part to the aforementioned statements recognized by the IAI, ***Therefore,***

be it further

RESOLVED, that Resolution 1979-7 and Resolution 1980-5 are hereby rescinded.

and be it further

RESOLVED, that a copy of this resolution be published in the Association's official publication.

Robert C. Sanders

Robert C. Sanders
Recording Secretary

MIAMI-DADE COUNTY, FLORIDA

MIAMI-DADE POLICE DEPARTMENT
9105 N.W. 25 STREET
MIAMI, FLORIDA 33172-1505

August 8, 2012

The Honorable Patrick J. Leahy
United States Senate
Committee on the Judiciary
224 Dirksen Senate Office Building
Washington, D.C. 20510-6275

Dear Senator Leahy:

Thank you for the opportunity to testify at the Senate Committee on the Judiciary hearing entitled "Improving Forensic Science in the Criminal Justice System" on July 18, 2012. The following information is provided in response to the questions asked by Committee members regarding a recently published study by the Miami-Dade Police Department Crime Laboratory on the accuracy of firearms identification.

Published Ruger Study:

The Miami-Dade Police Department Crime Laboratory conducted a research study on *The Repeatability and Uniqueness of Striations/Impressions on Fired Cartridge Casings Fired in 10 Consecutively Manufactured 9mm Ruger Slides* to improve the understanding of the accuracy, reliability, and measurement validity in the firearm and tool mark discipline of forensic science. The foundation of firearm and tool mark identification is that each firearm/tool produces a signature of identification (striation/impression) that is unique to that firearm/tool, and through the examination of the individual striations/impressions, the signature can be positively identified to the firearm/tool that produced it.

The 2009 National Academy of Sciences (NAS) Report, entitled *Strengthening Forensic Science in the United States: A Path Forward*, questioned the repeatability and uniqueness of striations/impressions left on fired evidence as well as the validity and error rate in firearm identification. This study analyzed the repeatability and uniqueness of striations/impressions on fired cartridge casings fired in 10 consecutively manufactured Ruger slides (one semi-automatic pistol and nine additional consecutively manufactured slides) by analyzing breech face striations/impressions through an evaluation of the participants' accuracy in making correct identifications. Although these slides were consecutively manufactured with the same equipment/tools, their signatures should still be different.

Test sets assembled included test fired casings from each slide, as well as unknowns. Participants were firearm & tool mark examiners throughout the United States. One hundred and fifty-eight test sets were distributed to laboratories in 46 states and the District of Columbia. The test sets were designed to evaluate an examiner's ability to correctly identify cartridge casings fired from 10 consecutively manufactured Ruger Slides to test fired cartridge casings fired from the same slides. This empirical study established an error rate of less than 0.1 percent.

This project was supported by Award No. 2009-DN-BX-K230 awarded by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice. This research paper can be retrieved from: https://www.ncjrs.gov/pdffiles1/nij/grants/237960.pdf. In addition to the above study, the current state of research encompasses a variety of studies from crime laboratories and academia in the discipline of firearm and tool mark identification:

With regard to the question asked by Committee members about the current state of research overall on the validity of firearm identification, the following information is provided:

Durability:

In 2011, a Durability Study was conducted at the Miami-Dade Police Department Crime Laboratory: *Comparison of 15,000 Consecutively Fired Casings from a 9mm Glock Model 26 Semiautomatic Pistol* (will be submitted for publication in the *Association of Firearm and Tool Mark Examiners'* journal). This study was conducted to determine if the tool marks on the head of fired casings would still be identifiable over the course of firing 15,000 cartridges from a 9mm Glock semiautomatic pistol. The fired casings were collected at 25 round intervals. Examination of the class and individual characteristics on the breech face of these fired casings reveled significant changes in the firing pin impression, while changes to the breech face markings and firing pin aperture shearing were minor. Casing number one was identified with casing number 15,001.

Glock Enhanced Bullet Identification System (EBIS) Barrels

The Miami-Dade Police Department Crime Laboratory is currently conducting research under Award No. 2010-DN-BX-K269 awarded by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice. The purpose of this research is to conduct an empirical study to evaluate the reproducibility and uniqueness of striations/impressions imparted to consecutively manufactured Glock Enhanced Bullet Identification System (EBIS) barrels with the same EBIS pattern, as well as to determine the error rate for the identification of same gun evidence. The MDPD has been researching/evaluating the Glock barrel since 1994. The Glock EBIS barrel is a polygonal barrel, which has a bar code like pattern added to it during the manufacturing process. This study will analyze the repeatability and uniqueness of striations/impressions on spent/fired bullets fired in 10 consecutively manufactured Glock EBIS barrels with the same EBIS pattern by analyzing their striations/impressions. Consecutively manufactured EBIS barrels with the same EBIS pattern are significant to the study because these barrels were manufactured with the same equipment/tools and exhibit the same EBIS pattern. Even though these barrels are consecutively made, their signatures should still be different. Test sets were assembled and distributed to 147 crime laboratories and the project is in the 5th month of data collection. Currently, 180 participants have returned their questionnaire/answer sheets. Thirty-four of the participants did not meet the eligibility-inclusion criteria, resulting in 146 participants. Some laboratories had multiple participants. The results of this study will also examine whether firearm and tool mark examiners will be able to identify unknown bullets fired through consecutively manufactured Glock EBIS barrels to the firearms that fired them utilizing individual, unique and repeatable striations/impressions and whether the experience level of firearm and tool mark examiners will affect results when examining bullets fired through consecutively manufactured Glock EBIS barrels.

Additional Glock EBIS barrel papers published by the Miami-Dade Police Department Crime Laboratory are enclosed:

Carr, J. and Fadul, T. (1997), The Miami Barrel. AFTE Journal, 29: 232-234.

Fadul, T. and Nunez, A. (2003), The Miami Barrel Saga Continues. AFTE Journal, 35: 290-297.

Fadul, T. and Nunez, A. (2006), Glock's New "EBIS" Barrel: The Finale to the Miami Barrel Saga. AFTE Journal, 38: 96-100.

Fadul, T. (2011), An Empirical Study to Evaluate the Repeatability and Uniqueness of Striations/Impressions Imparted on Consecutively Manufactured Glock EBIS Gun Barrels, AFTE Journal, 43: 37-44.

Proposed Study:

The Ames Laboratory at the Midwest Forensic Resource Center, in collaboration with the American Society of Crime Laboratory Directors/Forensic Research Committee, will conduct an empirical study to evaluate type 1 and type 2 errors for cartridge casing comparisons. The proposed project will investigate the abilities of firearms examiners to identify same gun evidence. Participants will receive a total of fifteen (15) sets in each collection. Each set will contain three (3) cartridge cases collected from the same handgun and one cartridge case in question. The participants will be requested to only compare the questioned casing with the three known test fires that are within a particular set and render an opinion of an Identification, Exclusion, Inconclusive, or Unsuitable. If the opinion is deemed Inconclusive, the participant will also be requested to provide a basis for this call. No other comparisons of the questioned casing will be requested. This "pair-wise" approach of only comparing one questioned casing with one group of known test fires (produced from the same firearm) addresses some potential interpretation problems and comparison biases that may be introduced when a "closed" sample set is used. The participants will be asked to report whether three, two, one, or none of the known test fires have adequately reproduced marks for comparison and whether the marks are adequate to confirm an identification between the known test fires from the known same source. This information will be used to measure a rate of production of casings with poorly reproduced marks.

Further, a compilation of published research conducted to support the foundation of the Firearm and Toolmark discipline is also enclosed.

Thank you for the opportunity to provide this information.

Sincerely,

Stephanie Stoiloff

Stephanie Stoiloff, Commander
Miami-Dade Police Department
Forensic Services Bureau

Glock's New "EBIS" Barrel: The Finale to the Miami Barrel Saga

By: Thomas G. Fadul Jr. and Adrian Nuñez, Miami-Dade Police Department, Miami, Florida

Key Words: Enhanced Bullet Identification System (EBIS), Glock, Readily Identifiable, Subclass Characteristics, The Miami Barrel

ABSTRACT

As Glock progressed in developing a barrel with identifiable markings, the Miami-Dade Police Department Crime Laboratory Bureau has examined improvements made by Glock in creating a barrel signature that is "readily identifiable" to the firearm examiner. Since the last publication, Glock has improved its tooling method creating a barrel that produces "readily identifiable" marks. This new method creates gross marks (possible subclass characteristics), allowing for quick indexing, and fine striations for improved identifications of test fired bullets. During the initial evaluation, sufficient individual characteristics were found for positive identifications. Durability testing revealed that the individual characteristics and the gross marks may change with wear; yet these barrels did prove to reproduce sufficient individual characteristics for positive identifications. Glock markets this new rifled barrel design as the Enhanced Bullet Identification System (EBIS).

Introduction:

As Glock continued their efforts to improve the Miami Barrel, our laboratory received three new Glock barrels (L24184, L24185 and L24186) on February 21, 2003. Bore examination of the three barrels found a series of fine lines appearing more pronounced than those previously reported in the last article [1]. These cuts appear randomly spaced with the same pitch as the polygonal rifling. Test bullets were obtained from each barrel using Speer Gold Dot .40S&W caliber, 180 gr. ammunition. All three barrels were cast with Elite H-D vinyl polysiloxane impression material for a more detailed inspection of the bore.

Initial Testing:

Initial test comparisons of the three barrels found significant transfer of gross marks on fired bullets, possible subclass characteristics from the barrels, yet careful examination rendered the barrels distinct and "readily identifiable" (meaning that several areas of the bullet can be positively identified to other bullets of the same brand fired from that barrel) [2]. Comparisons were made of the initial four rounds from each barrel. Similar appearing gross characteristics made from the deeper cuts repeated on several land impressions on test bullets from the same barrel (Figure 1). These gross characteristics also repeated from barrel to barrel (Figure 2). Although visually similar in overall width and depth, these gross characteristics were distinguished at higher powers of magnification (e.g. 25X), which also aided in visualizing the fine individual characteristics imparted in the land impressions. At 25 rounds, these similarities still persisted (Figure 3). This transfer of possible subclass characteristics did not hinder positive comparisons; though caution should be observed by examiners when using these marks for positive identifications.

Durability Testing:

3000 cartridges were fired through two barrels (L24185 and L24186).

Test bullets were obtained from each barrel using Speer Gold Dot .40S&W caliber, 180 gr. GDHP ammunition after firing 500 cartridges, 1000 cartridges, 1500 cartridges, 2000 cartridges, 2500 cartridges and 3000 cartridges.

Cast Comparisons:

The barrel casts of two barrels (L24185 and L24186) were sectioned into thirds and examined under the comparison microscope for changes in the gross cuts found on the lands. The breech end was compared to the muzzle end and changes were observed in the number, size and spacial relationship of the cuts. The muzzle end of L24185 was compared to the breech end of L24186 and similar findings were observed. These are good results for the examiner who must eliminate subclass transfer from barrel to barrel. Yet since only two barrels were compared and uncertainty exists regarding the consecutiveness in manufacturing, caution should still be observed when relying on these gross marks for positive identifications. Further testing is necessary to confirm the absence of subclass transfer.

Date Received: August 8, 2005
Peer Review Completed: August 31, 2005

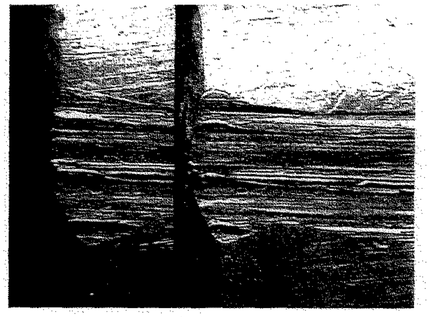


Figure 1 – Comparison of standards from L24184 out of phase by two land impressions.

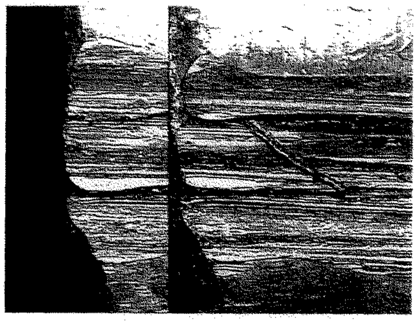


Figure 2 – Comparison of gross marks between barrels L24184 and L24185.

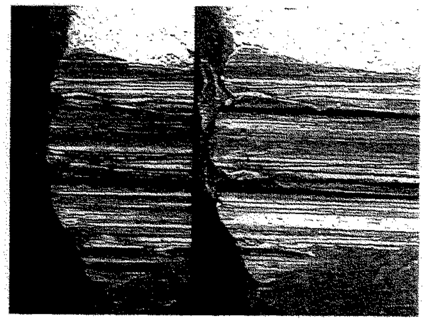


Figure 3 – Comparison of standards from barrel L24184 after 25 rounds.

Discussion:

Bullets obtained from the above testing were found to be "readily identifiable" (Figures 4, 5 and 6). There was some variance in the repeatability of the gross and individual characteristics among the tests from the same barrel; however, they were still identifiable. The gross and individual characteristics changed slightly between test firings as may be expected with wear (e.g. test from 500th shot as compared to test from 2000th shot) (Figure 7).

Test bullets from barrels L24185 and L24186 were microscopically compared after 3000 rounds. Even though test bullets from both barrels possessed some similar gross characteristics, they were still distinguishable from each other (Figure 8). The similarities in gross characteristics were no longer as pronounced but nevertheless aided in indexing and identification of tests from the same barrel.

Since these comparisons involved pristine bullets, all six land impressions were intact for examination. Damage to the bullets where only one or two land impressions remain may render comparisons difficult. This testing does not represent a real case scenario in which examiners are dealing with damaged and fragmented bullets. The examiner must be alert to the similarities in gross characteristics, and if necessary, omit those characteristics in a comparison examination.

Even though our findings suggest that gross (possible subclass) characteristics on consecutively manufactured land impressions can be differentiated, there remains the possibility that multiple lands from one barrel can have similar gross characteristics to multiple lands from another barrel. In the production of large numbers of barrels, the manufacturing techniques used to individualize these new barrels may result in some barrels that are very difficult to differentiate. Lengthy time periods between the incident and recovery of the firearm may increase the changes in gross characteristics remaining on the land impressions but should not hinder the outcome of positive identifications.

According to Glock, their patented tooling method may be manipulated to create 80,000 possible different combinations per caliber [3]. Glock's published patent application describes the process as a cutting or displacing of the barrel wall during manufacture by a "finger-like tool" of harder material that may create one or more cuts along the longitudinal axis following the pitch of the rifling [4].

Glock's new enhanced barrel is marketed as the "Enhanced Bullet Identification System" (EBIS) [5]. The Miami-Dade Police Department's Special Response Team is presently negotiating with Glock to incorporate the EBIS barrels with an order for Glock Tactical models in 9mm and .40 S&W calibers. Quoted prices may include a nominal additional fee per firearm. As of this writing, two agencies in our county have already implemented the EBIS barrels: South Miami Police Department included the EBIS barrels in their sixty newly issued .40S&W Glocks (Figure 9, comparison of standards) and the Sweetwater Police Department has on order similar firearms for its officers. These barrels are also being considered by the City of Miami Police Department and will be available to other departments across the country with similar concerns and needs.

Conclusion:

The new EBIS barrels present a significant advancement for the identification of polygonally rifled barrels. An examiner with knowledge of the machining methods, awareness of the possible subclass transfer and diminishing quality of these gross markings over time may still appropriately arrive at positive identifications. The individual characteristics persisted after 3000 rounds and the bullets were readily identifiable. The greater concern may be an examiner not familiar with these markings that relies on the gross characteristics alone for a positive identification.

Acknowledgements:

The Firearm and Toolmark Examiners of the Miami-Dade Police Department and the City of Miami Police Department Gun Squad.

References:

1. Fadul, T. and Nunez, A. "The Miami Barrel Saga Continues," AFTE Journal, Vol. 35, No. 3, Summer 2003, pp. 290-297.
2. Carr, J. and Fadul, T. "The Miami Barrel," AFTE Journal, Vol. 29, No. 2, Spring 1997, pp. 232-234.
3. Response letter from Glock, Inc. to the Miami-Dade Police Department's request for information regarding the Miami Barrels, dated July 16, 2004.
4. U.S. Patent App. No. US2003/0143354A1 published July 31, 2003.
5. Glock Invoice dated 6-13-2003, to the Miami Police Department.

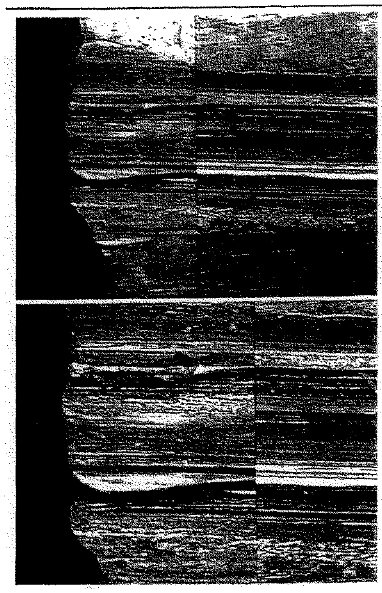


Figure 4 – Positive identification barrel L24184.

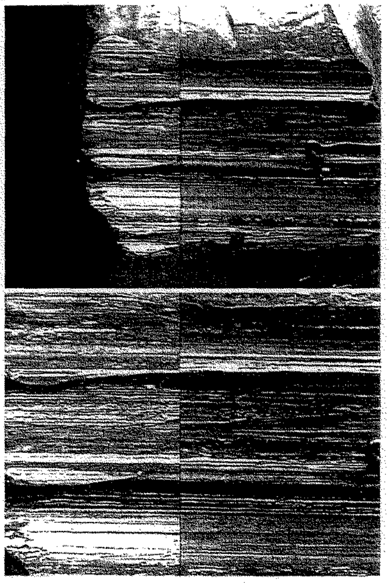


Figure 5 – Positive identification barrel L24185.

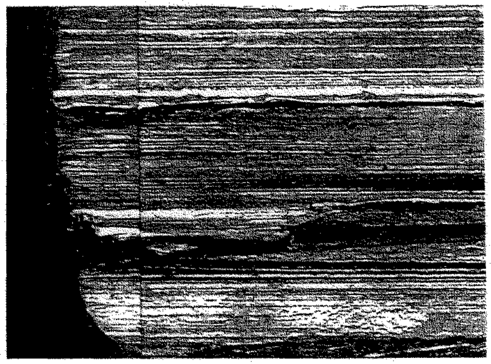


Figure 6 – Positive identification barrel L24186 after 500 rounds.

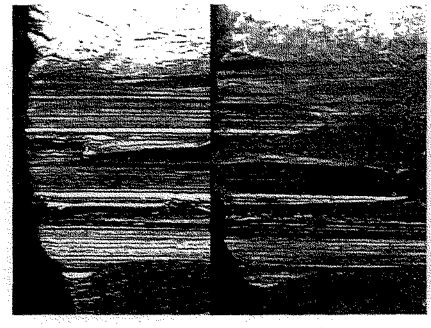


Figure 7 – Comparison of standards from barrel L24186 between rounds 500 and 2000.

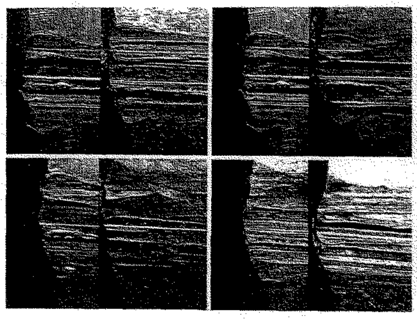


Figure 8 – Comparison of gross marks between barrels L24185 and L24186 after 3000 rounds.

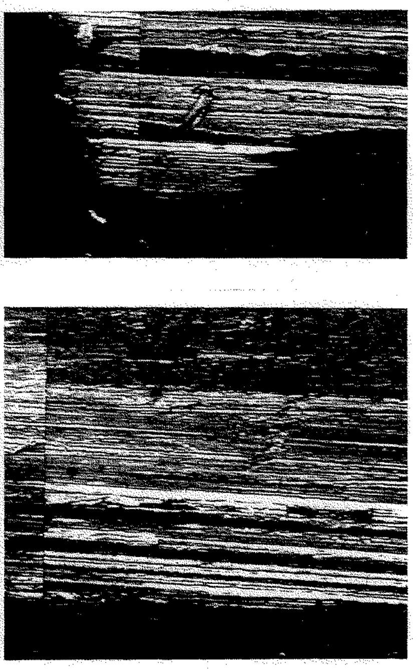


Figure 9 – Positive identifications with standards from the South Miami Police Dept's Glock equipped with the new EBIS barrel.

AFTE Journal--Volume 43 Number 1--Winter 2011

An Empirical Study to Evaluate the Repeatability and Uniqueness of Striations/Impressions Imparted on Consecutively Manufactured Glock EBIS Gun Barrels

By: Thomas G. Fadul Jr., Ph.D., Laboratory Manager, Miami-Dade Police Department

Keywords: Enhanced Bullet Identification System (EBIS), error rate, Miami Barrel, National Academy of Sciences, polygonal, subclass

ABSTRACT

The inability to identify fired bullets to individual Glock pistols resulted in an in-depth study of Glock's polygonal rifled barrels, which resulted in the manufacturing of the Miami Barrel. The Miami Barrel was designed with the intent to give the barrel a unique signature. Glock has marketed the Miami Barrel as the Enhanced Bullet Identification System (EBIS). These barrels present a significant advancement for the identification of polygonal rifled barrels. An examiner with knowledge of the machining methods, awareness of the possible subclass transfer and diminishing quality of these gross markings over time should still appropriately arrive at positive identifications and/or eliminations. The greater concern may be an examiner not familiar with these markings that relies on the gross characteristics alone for a positive identification. The Miami-Dade Police Department Crime Laboratory obtained 10 consecutively manufactured Glock EBIS Barrels to further explore the repeatability and uniqueness of striations/impressions, as well as the capability of identifying bullets fired through consecutively manufactured Glock EBIS Barrels. On a voluntary basis, 150 test sets were created and distributed to laboratories in forty-four states and nine countries. The test set was designed to determine an examiner's ability to correctly identify bullets fired from 10 consecutively manufactured EBIS Barrels to test fired bullets fired from the same barrels. Additionally, this empirical study established an error rate of 0.4 percent.

Introduction

High profile police involved shootings in the City of Miami led to the creation of the Miami Barrel. The Miami-Dade Police Department (MDPD) Crime Laboratory examined the evidence in these shootings and was unable to positively identify which officer's Glock pistol fired the fatal shots. The MDPD's inability to identify the fired bullets to an individual Glock pistol prompted political pressure within the community, as well as within the police community. This resulted in an in-depth study of Glock's polygonal rifled barrels, which led to the manufacturing of the Miami Barrel, which lead to the Enhanced Bullet Identification System (EBIS). To date, no testing has been conducted utilizing multiple consecutively manufactured EBIS Barrels. The problem area is whether or not the cutting tool used in the EBIS Barrel changes enough from barrel to barrel in order to allow examiners to distinguish between them.

Literature Review

Since the inception of the forensic science discipline of firearm and tool mark identification, there have been several research studies conducted and published on the topic. Although these studies have played a significant role in this discipline, as well as guided its mission, they have been primarily overlooked by the National Academy of Sciences.

The overview and purpose of this literature review was to identify past research involving studies of consecutively manufactured barrels that utilized multiple participants. Additionally, this literature review identified previous research conducted on polygonal barrels, as well as the Miami Barrel and the EBIS Barrel, to determine the capability of identifying a particular tool (firearm) to a specific tool mark (striated impression on a fired bullet). More specifically, it explores the issue of being able to identify a bullet as having been fired from a particular firearm to a reasonable degree of scientific certainty. Additionally, can firearm and tool mark examiners properly identify bullets that were fired from consecutively manufactured EBIS gun barrels?

Ruger Consecutively Manufactured Gun Barrels

Brundage (1998) conducted an empirical study to determine whether or not firearm and tool mark examiners could properly identify bullets that were fired from consecutively

---

Date Received: November 23, 2010
Peer Review Completed: January 7, 2011

manufactured Ruger gun barrels. Brundage obtained 10 consecutively manufactured 9mm Ruger firearm barrels from the Sturm Ruger Company. The test sets were sent to 30 firearm and tool mark examiners. The key results from the Brundage (1998) study indicated that after each of the 30 examiners returned their answer sheets, no incorrect identifications were made. The examiners were able to correctly distinguish the questioned bullets fired in multiple consecutively manufactured gun barrels. The data collected demonstrates that consecutively manufactured gun barrels differ from each other, producing different signatures. The data also allows for the generalization that firearm and tool mark examiners, on a national level, can identify bullets as having been fired through a particular barrel with a reasonable degree of scientific certainty [1].

Hamby (2001) also conducted an empirical study to determine whether or not firearm and tool mark examiners could correctly identify bullets that were fired from consecutively manufactured gun barrels. Hamby obtained the 10 consecutively manufactured 9mm Ruger firearm barrels that were utilized in the Brundage study. The test sets, including Brundage's, were sent to 204 firearm and tool mark examiners. The key results from the Hamby (2001) study indicated that after 201 examiners returned their answer sheets, no incorrect identifications were made. The examiners were able to distinguish the questioned bullets from multiple consecutively manufactured gun barrels. The data collected also demonstrates that consecutively manufactured gun barrels differ from each other, producing different signatures. The data also allows for the generalization that firearm and tool mark examiners, on a national level, can identify bullets as having been fired through a particular barrel with a reasonable degree of scientific certainty [2].

Hamby and Brundage (2007) continued the quest of the 1998 Brundage study using the 9mm Ruger firearm barrels. A total of 438 additional examiners from 17 countries participated and no incorrect identifications were made. In the United States, 47 states were represented in this study. Hamby and Brundage reported an error rate of .001 percent based on the data collected from all 438 participating examiners [3]. According to Nichols (2007), "error rates have been studied and can provide consumers of the discipline with a useful guide as to the frequency with which misidentifications are reported in the community using appropriate methodologies and controls." [4]

In 2009, Hamby, Brundage and Thorpe reported that their worldwide 10 consecutively manufactured Ruger barrel research project had a total of 507 participants from 20 countries. As of their publication in 2009, no incorrect identifications were reported [5].

The research and testing conducted by Brundage (1998), Hamby (2001), Hamby and Brundage (2007), and Hamby, Brundage and Thorpe (2009) demonstrated the general acceptance of the science through peer review and reproducibility, as well as demonstrated a means to determine an error rate [1,2,3,5].

Polygonal Rifled Barrels

Haag (1977) obtained one Heckler and Koch P9S pistol with polygonal rifling from the manufacturer for his study. Haag reported that the barrels of Heckler and Koch pistols were hammer forged, which is "a process that involves no cutting as the steel is compressed around the form" (p. 46). Haag indexed the bullets prior to test firing in order to assist with orientation for microscopic examinations. Haag reported that there were some matching striations amongst some of the bullets; however, "others revealed no positive comparison." [6]

Freeman (1978) obtained three consecutively manufactured 9mm caliber Heckler and Koch polygonal rifled firearm barrels. Freeman was able to correctly distinguish the questioned bullets from the consecutively manufactured Heckler and Koch polygonal rifled firearm barrels demonstrating that consecutively manufactured gun barrels differ from each other, producing different signatures. The key limitation reported by Freeman was that one of the Heckler and Koch polygonal rifled firearm barrels used in his study did not mark as well as the other two barrels examined by Freeman [7].

Hall (1983) obtained four consecutively manufactured polygonal rifled Shilen rifle barrels. He was able to correctly distinguish the questioned bullets from the consecutively manufactured polygonal rifled Shilen rifle barrels demonstrating that consecutively manufactured gun barrels differ from each other, producing different signatures. Hall (1983) noted that a subclass characteristic was present; however, it would not create a false identification [8].

Hocherman, Giverts and Shosani (2003) conducted a research study to determine whether or not a firearm and tool mark examiner could properly identify polygonal rifled bullets to the manufacturer of the firearm that it was fired in. Three types of polygonal rifled pistols were obtained which fit two profiles. They created known standards (test fired bullets) and question bullets using different Glock, Jerico and Heckler and Koch pistols. Six examiners were used in this study, and they had a 65% success rate in determining the manufacturer. The researchers reported that these results were due to a lack of training [9].

The New York Police Department (NYPD) (1996) conducted a research study comparing bullets that were fired through polygonal barrels and conventionally rifled barrels. The main purpose of the study was to determine the suitability of fired bullets for microscopic comparisons. The NYPD fired 10 cartridges each through 20 Glock polygonal barrels and 20 Glock conventionally rifled barrels. The NYPD concluded that the ability to identify bullets that were fired through polygonal barrels would be unlikely due to the barrels' inability to reproduce its signature. They also found that conventionally rifled barrels produced better microscopic marks for identification than polygonal barrels [10].

Valdez (1997) examined sets of bullets fired from 30 .40 S&W Heckler and Koch polygonal rifled firearm barrels. He concluded that the difficulty of identifying these bullets was the same as those fired from barrels with cut rifling. Valdez correctly identified 28 out of 30 sets and reported that the striations appeared to be accidental and unique [11].

Haag (2003; 2006) introduced bore lapping, a method that utilized a grinding compound to individualize polygonal barrels. He found that placing a couple of drops of a rubbing compound on the nose of a bullet that was fired in the weapon created reproducible, identifiable striations [12, 13]. Northcutt (2008; 2010) conducted an extensive research project which supported Haag's findings [14, 15]. In 2009, L. Haag, M. Haag, Garrett, Knell and Patel reported that bore lapping produced identifiable striations [16].

The Miami Barrel

Carr and Fadul (1997) conducted a study to determine whether or not a firearm and tool mark examiner could readily identify bullets that were fired from 22 different pistols. Additionally, five Glock barrels marked with the electronic spark reduction method were used. They obtained 22 different pistols and five Glock barrels marked with the electronic spark reduction. Three firearm and tool mark examiners participated in this study. This study found that all of the weapons except Glock and H&K marked the bullets in a readily identifiable state. The standard Glock barrels and the five Glock barrels marked with the electronic spark reduction method were listed as not readily identifiable. The inability to readily identify bullets fired in these Glock barrels began the revolution of what would become known as the Miami Barrel [17].

Fadul and Nunez (2003) conducted a study on the Miami Barrel to determine whether or not Glock barrels could produce readily identifiable striations. Fadul and Nunez used 22 Miami Barrels manufactured by Glock in their study. Nine firearm and tool mark examiners participated in this study. This study found that Glock used a single cutter that was pulled through their polygonal rifled barrel, which created a subclass characteristic. All nine examiners concluded that the new Miami Barrel was not readily identifiable [18].

Fadul and Nunez (2006) conducted a follow-up study on the Miami Barrel to determine whether or not Glock could produce readily identifiable striations. They used three Miami Barrels manufactured by Glock which incorporated a new version of the single cutter used in the Fadul and Nunez (2003) study. Glock called the new cutter the Enhanced Bullet Identification System (EBIS); however, the barrel itself was still known as the Miami Barrel. Fadul and Nunez (2006) concluded that the new Miami Barrel manufactured with the EBIS could reproduce readily identifiable striations. The key limitation to this study, however, was that only three barrels were examined and a concern was expressed regarding subclass characteristics. The greater concern may be that an examiner who is not familiar with these markings will rely on the subclass characteristics alone for a positive identification [19].

Chin and Sampson (2007) followed up the Fadul and Nunez (2006) study on the Miami Barrel manufactured by Glock to also determine whether or not the EBIS Barrel reproduced identifiable striations that would allow questioned fired bullets to be identified to known standards. The researchers used four Miami Barrels manufactured by Glock, which incorporated the EBIS. The questioned bullets and known standards were correctly identified. The researchers expressed the same concern that Fadul and Nunez (2006) expressed regarding the subclass characteristics [20].

Martinez (2008, 2009) conducted a study to test the durability of the EBIS Barrel to determine if the EBIS barrel reproduced identifiable striations that would allow questioned fired bullets to be identified to known standards. Martinez used 51 Glock pistols which incorporated the EBIS Barrel. A three year window existed between the initial test firing and the final test firing for this research study. Each pistol had at least 250 rounds fired through the barrel and no more than 10,000. The Martinez study reported that 29% of the participants (8 out of 28) with 5 to 10 years of experience reported that there were not enough individual characteristics present to conclude an identification and/or elimination. Additionally, 14% of the participants (4 out of 28) with 5 to 10 years of experience reported identifications and the ability to eliminate. Martinez believed that the identifications were made utilizing the process of elimination [21, 22, 23].

Materials & Methods

This study utilized an experimental research design (Christensen, 2004; Creswell, 2005), and was conducted in a crime laboratory setting [24, 25]. Participants examined and compared questioned bullets to the known standards, which were fired through ten consecutively manufactured Glock EBIS Barrels in order to determine whether or not consecutively manufactured Glock EBIS Barrels differ from each other, producing different signatures. Quantitative data (Creswell, 2005) was analyzed to determine if the examiners could correctly distinguish questioned bullets from multiple consecutively manufactured Glock EBIS Barrels. Survey/answer sheets were utilized to collect the quantitative data.

Research Question

Will firearm and tool mark examiners be able to identify the barrels that fired the questioned bullets when examining bullets fired through consecutively manufactured Glock EBIS Barrels?

Research Hypotheses

Firearm and tool mark examiners will not be able to correctly identify the Glock EBIS Barrels that fired the questioned bullets.

There is one dependent variable that was examined in this study. The dependent variable is accuracy, which measured whether or not the questioned bullets could be distinguished between the consecutively manufactured Glock EBIS Barrels. There is one independent variable in this study, which is assessment. Assessment is defined as the examination and comparison of the questioned bullets to the known standards, which were fired in ten consecutively manufactured Glock EBIS Barrels. The intervening variable is the amount of training, and experience of the examiners (participants). Extraneous variables were controlled by utilizing a laboratory setting, and through sampling.

Data Collection Methods

The primary investigator performed the following:

1. Sent email to the AFTE membership. Participation was voluntary.
2. Obtained ten Glock EBIS Barrels and labeled them 1 through 10.
3. Obtained Federal 9mm cartridges (ammunition/bullets).
4. Obtained a 9mm Glock pistol for the test firing.
5. Utilized a horizontal water tank for the test firing and retrieval of the bullets.
6. Placed each barrel one at a time in the Glock pistol.
7. Loaded Glock pistol with five cartridges.
8. Fired the weapon into the horizontal water tank.
9. Fired five bullets through each barrel to create one test set. (This was repeated 150 times per barrel, 750 bullets per barrel in total).
10. Used properly labeled containers (pre-labeled by the researcher) to keep each group of five bullets separated.
11. Labeled two of the five bullets with the number of the barrel in which they were fired in (1 through 10) to create the test fired bullets (known standards). They were placed in a coin envelope (pre-labeled by the researcher).
12. Labeled remaining three bullets with an alpha character designated by the researcher to represent the questioned bullets (different alpha characters were assigned to each barrel).
13. Randomly selected one questioned bullet from each barrel from the container and placed it in a coin envelope (pre-labeled by the researcher).
14. Selected an additional five questioned bullets to complete the test set of 15 questioned bullets. They were each placed in a coin envelope (pre-labeled by the researcher).
15. Created 150 test sets and placed each test set in a medium manila envelope.
16. Mailed test sets to participants. Each participant received one test packet through the mail which included the following:
    - o One questionnaire/answer sheet
    - o 15 questioned bullets
    - o 10 sets of test fired bullets (known standards) that were fired through 10 consecutively manufactured Glock EBIS Barrels.
17. Instructed the participants via the questionnaire/answer sheet to compare the questioned bullets to the known standards, and to place their answers on the questionnaire/answer sheet.
    - o The participants were also asked to complete the questions that were on the answer sheet.
    - o The instructions directed the participants to mail back the answer sheet in a self stamped and addressed envelope, or to fax it.
18. Conducted the data collection process.
19. Coded and copied data into SPSS (version 16).
20. Performed data analyses using SPSS.

Results

For this research study a mass email was sent out to the AFTE membership. A total of 238 examiners representing 150 crime laboratories in 44 states including the District of Columbia, as well as 9 countries responded that they wanted to participate. After six months of data collection, 215 participants completed the Consecutively Rifled Glock Miami Barrel Test Set Survey/Instrument. There were 24 individuals that did not respond and were removed from the study upon follow-up. A total of 32 of the 215 participants did not meet the training requirement for this study. This resulted in a data-producing sample of 183 participants.

The instrument utilized for this study allowed the participants to record their answer by circling the appropriate alpha designator of the unknown bullets on the same line as the known test fired bullet sets designated by a numerical character 1 – 10. This experimental exercise of the instrument was designed to measure accuracy. The alpha characters were coded as 1 = correct, 2 = incorrect. A total score of 183 for each of the alpha characters used was possible. A total assessment score of 15 indicated a score of 100%.

Each participant received a total of 10 pairs of known test fired bullets labeled Barrel 1 through Barrel 10, and 15 questioned fired bullets labeled with an alpha character. The participants examined and compared the 15 questioned fired bullets to the 10 pairs of known test fired bullets, which were labeled Barrel 1 through Barrel 10, and determined which barrel fired the 15 questioned fired bullets. The 15 questioned fired bullets were labeled with the following alpha characters: A,B,C,F,H,I,K,L,M,P,Q,R,U,X, and Y. Table 1 depicts the frequency and the percentage of the examination/comparison of each questioned fired bullet. There were a total of 2745 questioned fired bullets examined, which resulted in 2734 correct answers and 11 incorrect answers. The error rate was 0.4% based of the formula of Thompson and Wyant (2003), Figure 1.

Table 2 illustrates the frequency and percentage of the total number of correct answers based on a sliding scale of 1 – 15, with one point for every correct answer. A total of 176 participants (96.2%) scored the maximum of 15 points. Only seven participants (3.8%) did not achieve 100%. Five participants misidentified one questioned fired bullet, one participant misidentified two bullets and one participant misidentified four. These seven participants reported that they have never encountered the EBIS Barrel in case work.

Research Question

The research question asked if firearm and tool mark examiners would be able to identify the barrels that fired the questioned bullets when examining bullets fired through consecutively manufactured Glock EBIS Barrels. The dependent variable (accuracy) was compared against the independent variable (assessment – experimental exercise). The data collection revealed that 96.2% of the participants were able to correctly identify the Glock EBIS Barrels that fired the questioned bullets.

Hypothesis

The hypothesis stated: "firearm and tool mark examiners will not be able to correctly identify the Glock EBIS Barrels that fired the questioned bullets." The findings of this research study do not support this hypothesis. Based on this study, the analysis of the data revealed that 3.8% (n = 7) of the participants did not correctly identify the Glock EBIS Barrels that fired the questioned bullets. The data revealed that 96.2% of the participants were able to correctly identify the Glock EBIS Barrels that fired the questioned bullets. Additionally, the data collected demonstrates that consecutively manufactured gun barrels differ from each other, producing different signatures. The data also allows for the generalization that firearm and tool mark examiners, on a national level, can identify bullets as having been fired through a particular barrel with a reasonable degree of scientific certainty.

Conclusions

The findings of this research study supports the theory in firearm and tool mark identification that each firearm/tool produces a signature of identification (striation/impression) that is unique to that firearm/tool, and through examining the individual striations/impressions, the signature can be positively identified to the firearm/tool that produced it.

The most significant finding discovered by this researcher for the forensic discipline of firearm and tool mark examinations was the error rate for the examination of questioned bullets to the Glock EBIS Gun Barrels. The error rate, based on correct and incorrect answers of the participants, was established by this researcher to be 0.4%. There were a total of 2745 questioned fired bullets examined, which resulted in 2734 correct answers and 11 incorrect answers. A total of seven participants were responsible for the errors. There were 99.6% correct answers (n = 183).

Finally, this research study, although not intended to, addressed the questions that were raised by the 2009 National Academy of Sciences Report. The National Academy of Sciences Report questioned the repeatability and uniqueness of striations/impressions left on fired evidence as well as the error rate in firearms identification [26]. The error rate for the examination of questioned bullets to the Glock EBIS Gun Barrels was established by this researcher to be 0.4%. Additionally, the ability to identify the questioned fired bullets addressed the repeatability and uniqueness of striations/impressions.

Table 1: Examination/Comparison of Questioned Fired Bullets

Questioned Fired Bullets		Frequency	Percent
n=183			
A	Correct	181	98.9%
	Incorrect	2	1.1%
B	Correct	182	99.5%
	Incorrect	1	.5%
C	Correct	181	98.9%
	Incorrect	2	1.1%
F	Correct	183	100%
H	Correct	182	99.5%
	Incorrect	1	.5%
I	Correct	183	100%
K	Correct	182	99.5%
	Incorrect	1	.5%
L	Correct	183	100%
M	Correct	183	100%
P	Correct	183	100%
Q	Correct	183	100%
R	Correct	182	99.5%
	Incorrect	1	.5%
U	Correct	182	99.5%
	Incorrect	1	.5%
X	Correct	182	99.5%
	Incorrect	1	.5%
Y	Correct	182	99.5%
	Incorrect	1	.5%

Table 2: Total Score - Questioned Fired Bullets

Total Score	Frequency	Percent
n=183		
11	1	.5%
13	1	.5%
14	5	2.7%
15	176	96.2%
Total	183	100%

$$\frac{11}{2745 \text{ (183 participants x 15 Questioned Bullets)}} \text{ x } 100 = 0.4\%$$

Figure 1: Glock EBIS Barrel Error Rate

Limitations

There are several limitations to this study. First of all, this researcher did not witness the production of the barrels. The researcher had to rely on Glock for the authenticity of the consecutiveness of the barrels. Secondly, the 10 EBIS barrels utilized in this study did not have the same EBIS barcode pattern. Even though they were consecutively manufactured, some of the barcode-like patterns were different.

The researcher had to assume that the participants followed appropriate procedures. Each participant was administered the experimental exercise at their own crime laboratory via mail, and this researcher had no observable control. The researcher also had to assume that each participant independently completed the experimental exercise on their own with no outside assistance. Due to the nature of the participants, the researcher had no control over the training and skill level, as well as the experience of the participants. Firearm and tool mark examiners generally undergo a two year training program. This program could vary amongst law enforcement agencies. Additionally, the skill level of each person could vary depending upon the training and amount of examinations performed on a routine basis.

The researcher had no control of the equipment that participants utilized for the experimental exercise. The researcher had to assume that the equipment utilized was appropriate, properly maintained and in a functional condition.

Recommendations for Future Research

Further exploration into the manufacturing and identifiably of the EBIS Barrel is recommended. No study has been conducted to identify bullets from consecutively manufactured Glock EBIS Barrels that have the same EBIS patterns. The EBIS Barrel is a polygonal barrel, which has a barcode-like pattern added to it during the manufacturing process. Research on this topic has included consecutively manufactured EBIS Barrels; however, some of the barcode-like patterns were different.

Utilizing barrels with the same EBIS pattern as well as a larger sample size will lead to a more precise error rate calculation for the identification of same gun evidence by firearm and tool mark examiners. Additionally, it will document the reliability and reproducibility as well as the individuality of the EBIS Barrels.

Further research will continually improve the scientific foundation of forensic firearm and tool mark identification through evaluation, testing and study to determine the uniqueness of striations/impressions. Furthermore, it will allow the error rates for identification of same gun evidence to be calculated from the additional data. This empirical data will continue to strengthen the foundation of firearms identification.

Acknowledgements
Thank you to Dr. James Hamby who permitted this researcher to adapt the Consecutively Rifled P85 Barrel Test Set Survey/ Answer Sheet.

Miami-Dade Police Department Crime Laboratory Firearm and Tool Mark Examiners.

References

[1] Brundage, D., The Identification of Consecutively Rifled Gun Barrels. AFTE Journal, 30(3), 1998, 438 – 444.
[2] Hamby, J., Forensic Firearms Examination. Unpublished doctorial thesis, University of Strathclyde, Glasgow, Scotland, U.K., 2001.
[3] Hamby, J., & Brundage, D., The Identification of Consecutively Rifled 9mm Pistol Barrels. Paper presented at the meeting of the Association of Firearm and Tool Mark Examiners Annual Training Seminar, San Francisco, CA, May, 2007.
[4] Nichols, R., Defending the Scientific Foundations of the Firearms and Tool Mark Identification Discipline: Responding to Recent Challenges [Abstract]. Journal of Forensic Sciences, 52(3), 2007, 586 – 594. Retrieved November 28, 2007 from Academic Search Premier.
[5] Hamby, J., Brundage, D. & Thorpe, J., The Identification of Bullets Fired from 10 Consecutively Rifled 9mm Ruger Pistol Barrels: A Research Project Involving 507 Participants from 20 Countries. AFTE Journal (41)2, 2009, 99 – 110.
[6] Haag, L., Heckler & Koch Polygonal Rifling. AFTE Journal, 9(2), 1977, 45 – 47.
[7] Freeman, R., Consecutively Rifled Polygon Barrels. AFTE Journal, 10(2), 1978, 40 – 42.
[8] Hall, E., Bullet Markings from Consecutively Rifled Shilen DGA Barrels. AFTE Journal, 15(1), 1983, 33 – 53.
[9] Hocherman, G., Giverts, P., & Shosani, E., Identification of Polygonal Barrel Sub-family Characteristics. AFTE Journal, 35(2), 2003, 197 – 200.
[10] City of New York Police Department. Ballistics Comparison of Polygonal and Conventionally Rifled Glock Barrels. (Communication No. 65/96). New York: Dominic Buccigrossi, 1996.
[11] Valdez, S., Bullet Identification from H & K USP Polygonal Barrels, AFTE Journal, 29(3), 1997, 307 – 309.
[12] Haag, L., Identifiable Bullets from Glocks in 60 Seconds. Paper presented at the meeting of the Association of Firearm and Tool Mark Examiners Annual training seminar,

Philadelphia, PA, May, 2003.

[13] Haag, L., RE: Glock's New EBIS Barrel by Fadul and Nunez [Letter to the editor]. AFTE Journal, 38(3), 2006, 189.

[14] Northcutt, A., Glock Barrel Modification: A Feasible Method to Facilitate the Identification of Fired Bullets, NFEA Class 0701, 2008.

[15] Northcutt, A., Glock Barrel Modification: A Feasible Method to Facilitate the Identification of Fired Bullets, AFTE Journal, 42(2), 2010, 108 – 119.

[16] Haag, L., Haag, M., Garrett, L., Knell, J., & Patel, M., Bore Lapping Compounds and Their Effect on Traditional Firearms Identification, AFTE Journal, 41(3), 2009, 232 – 245.

[17] Carr, J., & Fadul, T., The Miami Barrel. AFTE Journal, 29(2), 1997, 232 – 233.

[18] Fadul, T., & Nunez, A., The Miami Barrel Saga Continues. AFTE Journal, 35(3), 2003, 290 – 297.

[19] Fadul, T., & Nunez, A., Glocks New EBIS Barrel: The Finale to the Miami Barrel. AFTE Journal, 38(2), 2006, 96 – 100.

[20] Chin, J., & Sampson, B., Glock Enhanced Bullet Identification System (EBIS) Barrels. Paper presented at the meeting of the Association of Firearm and Tool Mark Examiners Annual training seminar, San Francisco, CA, May 2007.

[21] Martinez, C., Glock's Signature Barrel – Durability of the EBIS Markings, NFEA Class 0701, 2008.

[22] Martinez, C., Glock's Signature Barrel – Durability of the EBIS Markings. Paper presented at the meeting of the Association of Firearm and Tool Mark Examiners Annual Training Seminar, Honolulu, HI, May, 2008

[23] Martinez, C., Glock's Signature Barrel – Durability of the EBIS Markings. AFTE Journal, 41(4), 2009, 325 – 399.

[24] Christensen, L., Experimental Methodology, (9th ed.). Boston, MA: Pearson, 2004.

[25] Creswell, J., Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research (2nd ed.) Upper Saddle River, NL: Pearson, 2005.

[26] National Academy of Sciences, Strengthening Forensic Science in the United States: A Path Forward. Washington D.C.: The National Academies Press, 2009.

AFTE JOURNAL (VOLUME 29, NUMBER 2) SPRING 1997

THE MIAMI BARREL

By James Carr, & Thomas Fadul, Metro-Dade Police Department, Miami, Florida

Key Words: The Miami Barrel, Electronic Spark Reduction Method, New York Barrel, Readily Identifiable, Not Readily Identifiable

Introduction:

The City of Miami Police Department had a series of high profile police-involved shootings, resulting in mass media attention due to the fact that the projectiles from the above cases were not identified to the Glock pistols of the shooting officers.

Due to the concerns raised by the City of Miami Police Department about the Metro-Dade Crime Laboratory's inability to consistently positively identify projectiles fired from Glock pistols, Glock Inc. modified their traditional gun barrel for them. This special order became known as "The Miami Barrel".

> "The new design - if proven - would provide a unique signature on bullets fired from each Glock barrel, thus making it more identifiable than guns currently in use" [1].

The Miami Barrel:

Glock Inc. placed marks in the barrel with a process described as the "electronic spark reduction method". The marks are small and generally rectangular in shape. The metal appears slightly depressed and melted. The intended purpose of these marks was to make the barrel more identifiable. The Metro-Dade Police Department Crime Laboratory received five of these modified barrels to examine. The number of marks placed in the barrel ranged from one to three. All were marked just inside of the muzzle (see photo).

Testing:

The Metro-Dade Police Department was asked to participate in a evaluation of the below listed pistols and ammunition by the City of Miami Police Department. Twenty-two 40 S&W caliber semi-automatic pistols and five separate Glock barrels marked with the "electronic spark reduction method" were tested using two brands of ammunition:

1. Winchester Ranger SXT, 180 grain cartridge
2. Speer Lawman Gold Dot, 180 grain cartridge

The firearms submitted for the testing were two each of the following:

Smith & Wesson, Model 4043
Smith & Wesson, Model Sigma 40F
Beretta, Model 96D
Beretta, Model 96D-Police Special
Beretta, Model 96D Centurion
Sigarms, Model P229
Ruger, Model P91
Ruger, Model P94
Heckler & Koch, Model USPV5
Taurus, Model PT100
Glock, model 22
Five Glock barrels, marked by "electronic spark reduction method"

The purpose of the test was to microscopically compare bullets fired from the same gun against each other to determine the identifiability of that pistol's barrel signature.

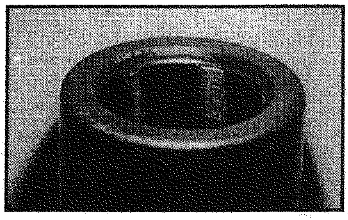
Evaluation:

After test preparation and firing, microscopic examinations were conducted by three Firearm and Toolmark Examiners. Each of the three examiners spent approximately one day evaluating the test fired bullets. Each examiner was asked to independently give his opinion on both brands of ammunition and the identifiability of each brand to make and model pistol that fired them.

(Continued on page 233)

(Continued from page 232)

The examiners were asked to state their results in one of two ways. Either the bullets were "readily identifiable" or the bullets were "not readily identifiable".



GLOCK BARREL MARKED WITH THE
" ELECTRONIC SPARK REDUCTION METHOD"

The result of "readily identifiable" means that several areas of the bullet can be positively identified to other bullets of the same brand fired from that pistol. It further describes the signature of a fired bullet that is typically received in this laboratory as evidence and because of the quality of the signature, we expect to identify it with the comparison microscope.

The result of "not readily identifiable" means that tests of the same brand fired in the same pistol could not be positively identified or that the identification generally could only be made on a small or select area of the bullet. The term further describes the signature of a fired bullet that is typically received in this laboratory as evidence and because of the general lack of detail or repeatable markings that identifications are difficult or sometimes impossible. It should be noted that all of the test bullets examined are not damaged or expanded, and therefore, they have the potential of receiving maximum transfer of barrel signature for that brand and type of ammunition.

Conclusion:

All of the tested firearms, except for the Glock and Heckler and Koch, marked both brands of the aforementioned ammunition in a "readily identifiable" manner. The standard Glock barrel and the five Glock barrels marked by electronic spark reduction were listed as "not readily identifiable" in that any identifications were generally confined to one area or small select areas and were more difficult to find than identifications on the tests fired in the other pistols tested.

The examiners found that the five Glock barrels marked by the "electronic spark reduction method" did not significantly enhance the identifiability of the bullets that were fired through them as compared to the original Glock barrel and to the other firearms in the study.

Two other brands of ammunition were then fired through the marked Glock barrels (Winchester 180 grain FMJ, and Federal 155 grain Hydra-shok) and the results were the same.

The New York Police Department did an in-depth study [2] on the New York Barrel, by Glock. The New York Barrel was a special order that had conventional rifling. NYPD compared tests fired from twenty Glock pistols with their traditional rifling, twenty Glock pistols with the New York Barrel, and twenty Smith & Wesson pistols. They found that the New York Barrels were a little improvement over the traditional Glock barrel, however, substantially less than the Smith & Wesson.

The Glock barrel is defined by Kasler [3] as hammer-forged hexagonal rifling. The resulting interior is smoother and more rounded than most other barrel types resulting in less barrel signature transfer to the bullet.

Acknowledgments:

The Firearm and Toolmark Examiners of the Metro-Dade Police Department.

Dominic Buccigrossi and the Ballistics Squad of the New York Police Department.

(Continued on page 234)

AFTE JOURNAL (VOLUME 29, NUMBER 2) SPRING 1997

(Continued from page 233)

Footnotes:

[1] Gates, Robert, quoted by Epstein, Gail, "Glock: New Barrels Will Mark Bullets", Miami Herald, June 1994, p. 1B.

[2] Buccigrossi, Dominic, "Ballistics Comparison of Polygonal and Conventionally Rifled Glock Barrels", dated May 21, 1996, New York Police Department Memorandum, pp. 1-10.

[3] Kasler, Peter, Glock - The New Wave In Combat Handguns, Paladin Press, 1992.

References:

Hart, Robert, "The Miami Barrel and Glock Identifications". Presented at the 26th AFTE Training Seminar, San Diego, Ca. May, 1995.

290 *AFTE Journal-Summer 2003* *Volume 35, Number 3*

The Miami Barrel Saga Continues

By: Thomas G. Fadul Jr. and Adrian Nuñez, Miami-Dade Police Department, Miami, Florida

Key words: Electronic Spark Reduction Method, Glock, Not Readily Identifiable, Polygonal, Readily Identifiable, Subclass characteristics, The Miami Barrel

ABSTRACT

The Electronic Spark Reduction Method which resulted in "The Miami Barrel" was not found to significantly enhance the identifiability of fired bullets. Glock was contacted by the City of Miami Police Department and was asked to further research and develop a new barrel. The Miami-Dade Crime Laboratory Bureau was asked to evaluate and report on the reproducibility of marks left by the new barrels. Glock developed a tool to create additional marks in the barrels. This tool created gross marks (subclass characteristics), allowing quick indexing and improved identifications of test fired bullets

Sufficient individual characteristics were found for positive identifications during the initial testing. Durability testing revealed that the individual characteristics and gross marks (subclass characteristics) failed to reproduce as they originally did. It was concluded that the changes made to the Glock barrels by the new tool did not render them readily identifiable..

Introduction:

Various officer-involved shooting incidents reached a climax on April 30, 2001, when an 18 year-old subject was shot by an officer from the City of Miami Police Department (MPD) after fleeing in a stolen Jeep. Three officers who pursued and fired were carrying .40S&W Glock pistols. (1)

The Miami-Dade Police Department (MDPD) Crime Laboratory received the evidence in this case, and after examination, was not able to positively identify which officer's Glock pistol had fired the fatal shot. These findings stirred the community and attracted mass media attention reminiscent of that in the early to mid 1990's, which resulted in an in-depth study of Glock's polygonal-rifled barrels. (2) The Miami-Dade County State Attorney's Office had the evidence forwarded to the Bureau of Alcohol, Tobacco and Firearms (BATF) who concurred with the original findings. This prompted new research and development for a new, readily identifiable Glock barrel.

History:

Prior to 1994, The City of Miami Police Department had a series of high profile police-involved shootings. This resulted in a wide range of community attention due to the fact that the projectiles were not identifiable to the Glock pistols of the shooting officers. At this time, the issued duty weapon of MPD officers was the 9mm Glock pistol, with the department's intent to transition to a .40S&W Glock pistol.

On June 15, 1994, the late John Matthews, formerly of the Royal Canadian Mounted Police (RCMP) laboratory, and a Glock representative met with lab personnel and MPD due to the concerns raised regarding Glock pistols and the inability to consistently identify spent projectiles. While at the MDPD laboratory, Matthews used a scribe to create crude toolmarks inside the barrel, which resulted in a personal signature for each (photo 1). This meeting led Glock Inc. to modify their traditional gun barrel using the Electronic Spark Reduction Method (ESRM) which resulted in "The Miami Barrel"(3) (photo 2). After testing this modified Glock barrel, the ESRM was not found to significantly enhance the identifiability of the bullets (photo 3).

In November 1995, the New York City Police Department (NYCPD) conducted their own series of tests using 9mm Glock 19 pistols with standard polygonal barrels and others with specially designed "conventionally rifled" barrels. (4) The latter barrels were constructed using the same hammer-forging method Glock utilizes; however, the mandrel had lands and grooves cut into them prior to manufacture. The testing using the standard polygonal barrels found 97 of 200 projectiles produced sufficient individual characteristics for a positive identification. On about 90% of these identifications, only approximately 17% of the useful surface of pristine bullets contained useful individual characteristics. The "conventionally rifled" Glock barrels produced sufficient individual characteristics in 183 of 200 projectiles examined. Approximately 53% of the useful surface of these pristine bullets contained the individual characteristics for

Received: December 2, 2002
Peer Review Completed: October 30, 2003

an identification. The NYCPD's results specified that damage to bullets with polygonal rifling (i.e. terminal ballistics) would make an identification very difficult. As for the bullets from "conventionally rifled" Glock barrels, damage would reduce the ability for an identification to a degree that the benefits over the polygonal were only slight. These benefits, if any, would be considerably less than those found in typical conventionally rifled barrels such as those in Smith & Wesson firearms.

On September 27, 2001, the Miami-Dade Police Department was requested to evaluate two modified .40 caliber Glock barrels. Examination of the two barrels revealed that a toolmark had been made in eight different areas at the muzzle of each barrel. It looked as though some type of tool, possibly a chisel of some type, was used to crudely place these tool marks. Initially ten cartridges were fired through each barrel. Two brands of ammunition were used for the testing:

.40 S&W Winchester Ranger, 180 grain SXT
.40 S&W Speer Gold Dot, 180 grain GDHP

Microscopic examination revealed that projectiles fired through the barrel with serial number L18468 were marked by only one of the eight toolmarks in a manner deemed identifiable (photo 4). With regards to projectiles fired through the second barrel with serial number L18469, two of the eight toolmarks left identifiable markings.

Additionally, three hundred (300) rounds were fired through the barrel, serial number L18469. Projectiles 100, 200 and 300 were examined for durability. These projectiles were determined to be identifiable.

Current Testing:
On January 29, 2002, the Miami-Dade Police Department received ten Glock barrels to test and evaluate. A total of twenty-seven bullets (.40 S&W 180 grain Speer Gold Dot) were fired through each barrel. The first 25 fired were to create wear in the barrel and the last two were retained for comparison purposes. Examination of the projectiles and barrels revealed what appeared to be fine lines randomly spaced around the circumference. Five of the ten barrels produced projectiles that were identifiable; however, they were "not readily identifiable" (photo 5). The terms "readily identifiable" and "not readily identifiable" are described by Carr and Fadul (5) as follows:

"The result of 'readily identifiable' means that several areas of the bullet can be positively identified to other bullets of the same brand fired from that pistol (barrel). It further describes the signature of a fired bullet that is typically received in this laboratory as evidence and because of the quality of the signature, we expect to identify it with the comparison microscope."

"The result of 'not readily identifiable' means that tests of the same brand fired in the same pistol (barrel) could not be positively identified or that the identification generally could only be made on a small or select area of the bullet. The term further describes the signature of a fired bullet that is typically received in this laboratory as evidence and because of the general lack of detail or repeatable markings that identifications are difficult or sometimes impossible. It should be noted that all of the test bullets examined are not damaged or expanded, and therefore, they have the potential of receiving maximum transfer of barrel signature for that brand and type of ammunition."

Casts were made of five barrels using hydrophilic vinyl polysiloxane (silicon rubber) casting material, brand name Elite H-D, and an extrusion gun. Luke Haag's testing of this material found it suitable for casting the bore of barrels. (6) One barrel was cross-sectioned and examined (photo 6). Under the stereomicroscope, eight fine lines running the length of the barrel were visualized (photo 7). A tool is most likely pulled or pushed through, then the configuration is changed for the next barrel. According to a BATF source, the tool is started at the 12 o'clock position for the first barrel, then changed for each barrel. The tool appears to twist with a similar pitch as the rifling; it flows along with the land and grooves. Glock advised that the tool is pending patent approval and no further information was available.

Examination under the comparison microscope found these lines do reproduce as gross marks on the bullets. These marks displayed similarities from one barrel to the next and were determined to be subclass characteristics of these new Glock barrels. Concern arose regarding the misuse of these gross marks for identification purposes.

On May 10, 2002, six more barrels were tested and 27 rounds fired through each. Fine lines that were seen on the casts of the barrels were not scoring the circumference of the bullets. A large number of gross markings were repeating from barrel to barrel. As a result, the barrels were found to be not readily identifiable.

On May 29th, a meeting was held between Glock, the City of Miami Police Department and the Miami-Dade Crime Laboratory. Glock's Chief Engineer Reinhold Hirschheiter explained that one tool with a single cutter is used to create the additional marks in the barrels. The tool is passed automatically by machinery producing multiple strikes at each groove. Glock was informed that the cuts being made needed to be deeper and thicker, and be able to score the bullets at their circumference consistently. Glock agreed to change their specifications to meet our requests, and suggested that a future possibility to consider involved bar coding the barrels. Pictures 8 and 9 (courtesy of Mr. Hirschheiter) depict a cross-section view of the cut produced by the Glock tool and the mark left on a bullet.

Six new barrels were received on July 17th after complying with the requests made at the prior meeting. As before, the barrels were cast and tests fired through each. Initial observations found the gross marks on the casts to be very pronounced. These same gross marks were observed under the microscope as multiple deep cuts or grooves within each land impression (photo 10). Again, concern arose relating to the repeatability of these gross marks from one barrel to the next. These gross marks were considered a subclass characteristic that these Glock barrels obtained during manufacture (photo 11). A total of nine examiners independently examined tests fired through each barrel, as well as, comparison of tests from different barrels. All examiners concluded that each barrel was readily identifiable. There were areas of gross markings that were similar from barrel to barrel (photo 12), however, they could be easily differentiated once the bullet was completely examined and individual characteristics taken into account (photo 13). The problem still existed where a damaged projectile or wear to the barrel could leave little individual characteristics and only the gross markings observed. An examiner unfamiliar with these subclass characteristics could easily misinterpret them for individual characteristics.

The City of Miami Police Department was given 2 barrels and fired 3000 rounds in each to test the durability of the cuts made by the Glock tool. During the testing, two bullets were retained for comparison purposes after reaching the following number of rounds: 250, 500, 1000, 1500, 2000, 2500 and 3000. It should be noted that after each session of test firing, the weapons were cleaned prior to firing. Again examiners were asked to independently evaluate tests from each barrel and tests from the two different barrels and determine whether they are readily identifiable.

The results of the microscopic examination revealed that the bullets obtained from the above testing were found to be "not readily identifiable". It should be noted that it was possible to make a positive identification in select areas of the bullets; however, that does not meet our criteria of readily identifiable. Significant deterioration of individual characteristics could be seen as early as the 250th test fire (photos 14 and 15).

It was also noted that the gross characteristics that marked the bullets very well before the above testing failed to reproduce as it originally did. The width, depth and definition of the gross marks diminished as the testing progressed. By the 3000th round, indexing of the test fires becomes very difficult as the gross marks used prior where either hardly visible or non-existent. Pictures 16 through 21 demonstrate the loss of individual and sub-class characteristics from the initial tests compared to the final tests.

The findings of this study have been reported to the City of Miami Police Department. Further testing is anticipated as Glock continues their efforts to improve the Miami Barrel.

Acknowledgements:

The Firearm and Toolmark Examiners of the Miami Dade Police Department.

Dominic Buccigrossi, formally of the New York Police Department.

Sergeant Armando Valdes and the Miami Police Department's Firearms Training Unit

A special thanks to Bob Hart, Jess Galan, Alan Lynn, George Hertel and Tim Wilmot.

REFERENCES

"Fla. Shootings Anger Black Leaders," Associated Press, www. sierratimes.com/archive/files/sep/04/arap2-090401.htm.

Carr, J. and Fadul, T, "The Miami Barrel," AFTE Journal, Vol. 29, No. 2, Spring 1997, pp. 232-234.

Supra Note 2

Buccigrossi, Dominic, "Ballistics Comparison of Polygonal and Conventionally Rifled Glock Barrels," Memorandum, New York Police Department, New York, NY, 1996.

Supra Note 2

Haag, L, "A Novel Silicon Rubber Extrusion Gun For Use In Toolmark And Firearms Examinations," AFTE Journal, Vol. 29, No. 2, Spring 1997, pp. 213-214.

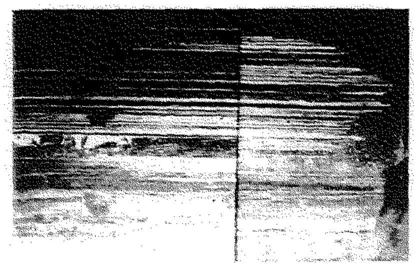


Photo 1: Comparison of bullets fired through a barrel scribed by John Matthews

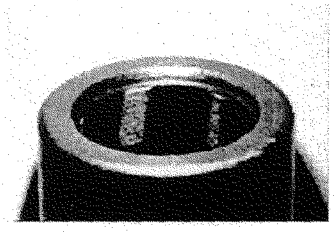


Photo 2: The Miami Barrel with ESRM

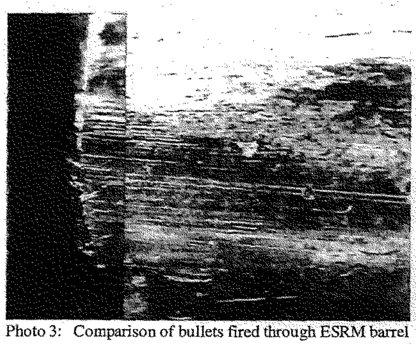


Photo 3: Comparison of bullets fired through ESRM barrel

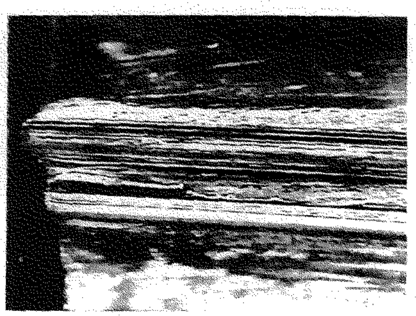


Photo 4: Bullet depicting toolmark imparted by chisel-like tool

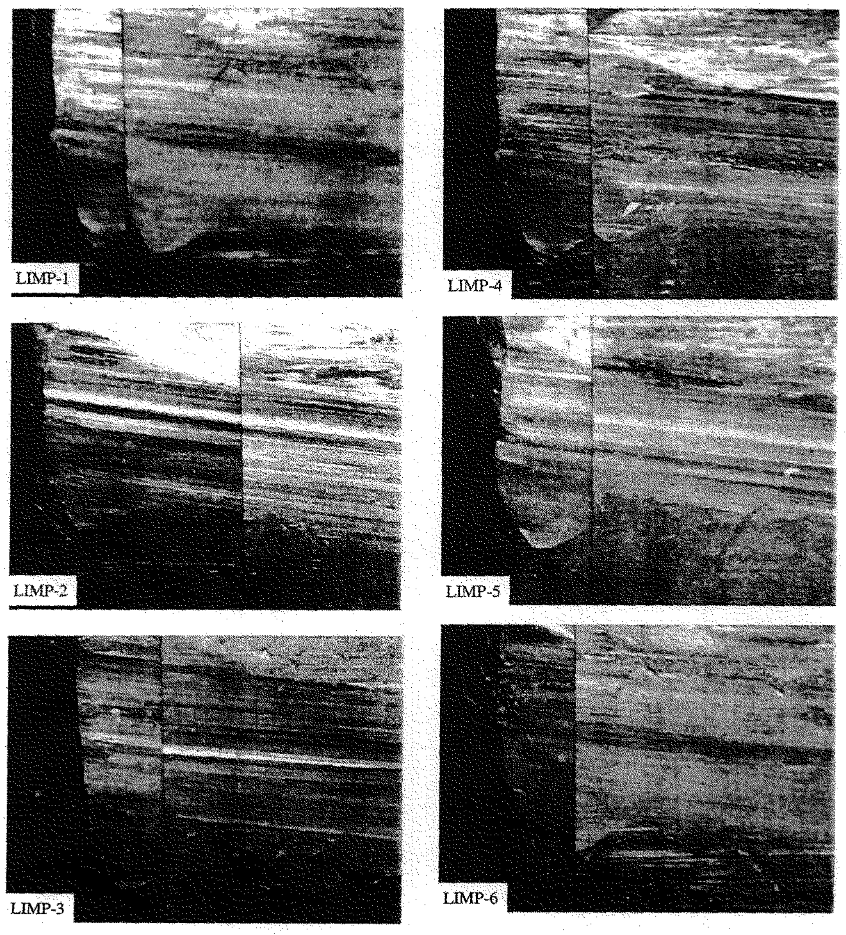


Photo #5: 40 S&W Glock barrel,
serial number L20075,
rounds #26 and #27

Photo 5: Six land impression comparisons deemed not readily identifiable

Photo 6: Cross section of barrel.

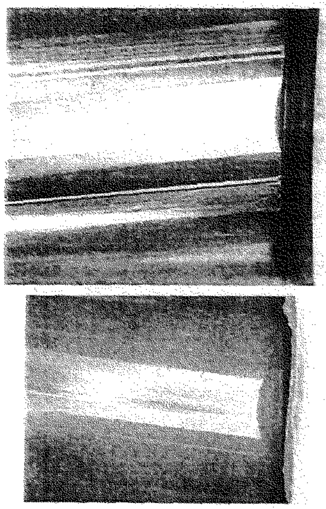


Photo 7: Cross section of barrel and cast at muzzle end

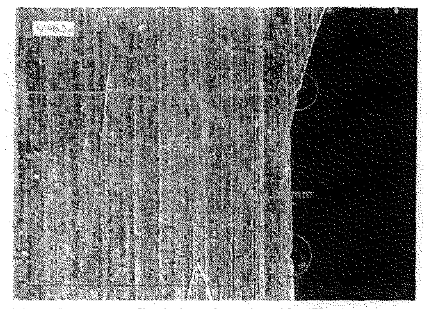


Photo 8: Cut in barrel produced by Glock tool

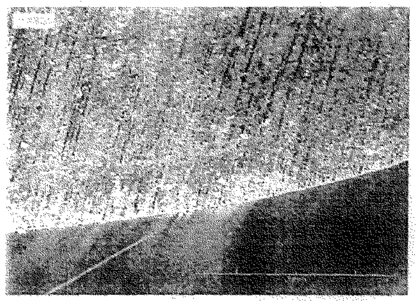


Photo 9: Mark left in bullet from cut in Photo 8

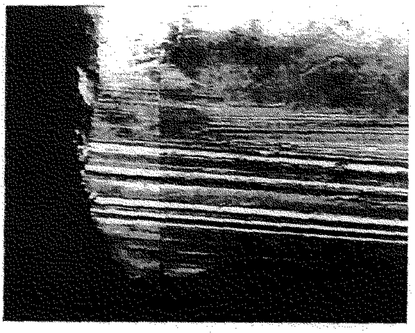


Photo 10: Gross marks, example of subclass characteristics in phase

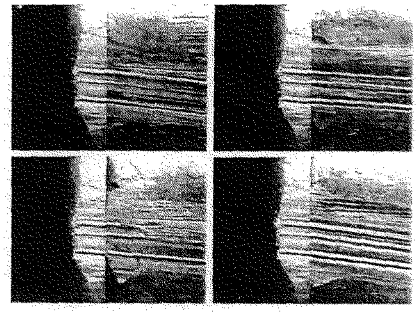


Photo 11: Gross mark comparisons, different land impressions within same barrel

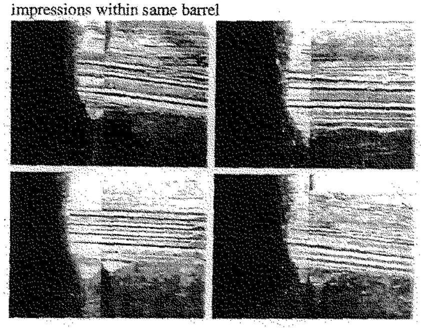


Photo 12: Gross mark comparisons, of two different barrels

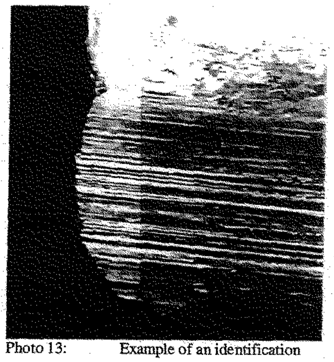


Photo 13: Example of an identification

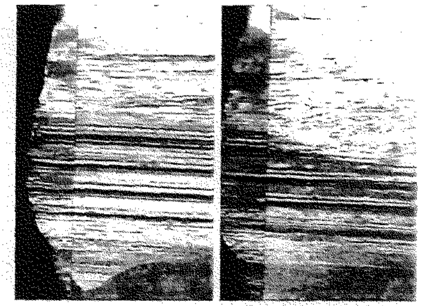


Photo 14: Comparison reference Barrel L21753: left side is bullets 26 & 27, on the right is bullets 27 & 250

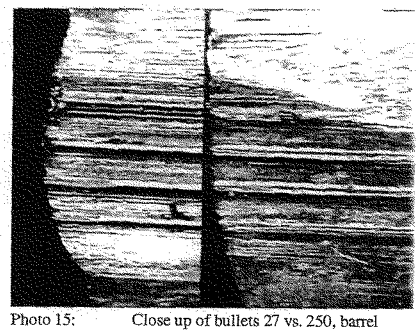
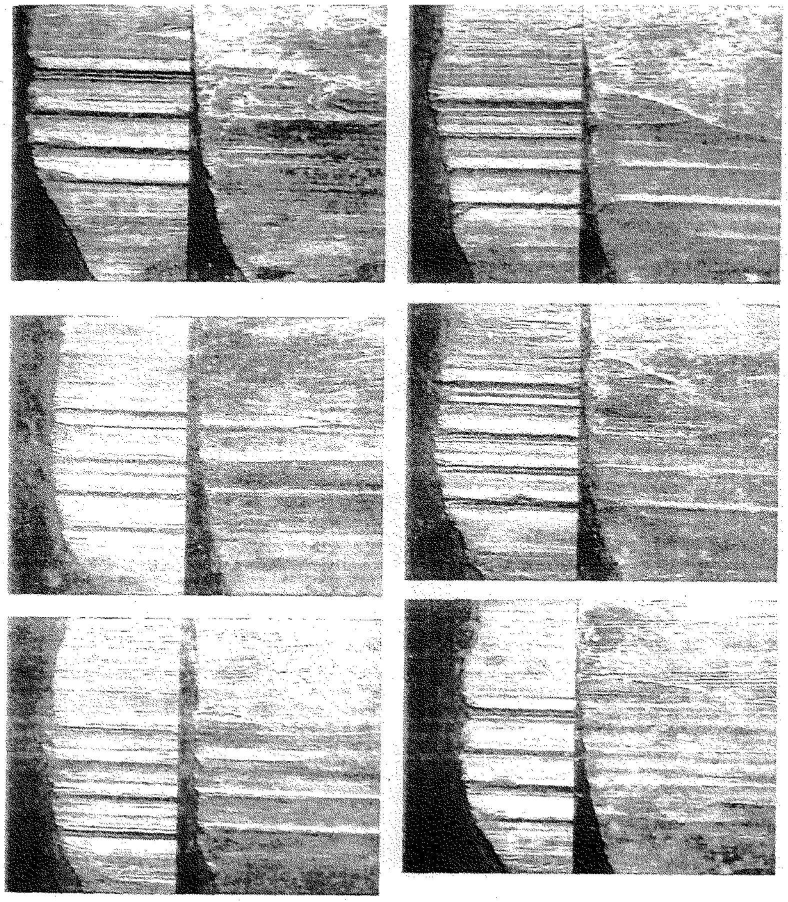


Photo 15: Close up of bullets 27 vs. 250, barrel L21753



Photos 16 - 21: Exhibits the six land impressions of barrel L21753, bullets 27 vs. 3000

SUBMISSIONS FOR THE RECORD

National District Attorneys Association
44 Canal Center Plaza, Suite 110, Alexandria, VA 22314
703.549.9222 (o) • 703.836.3195 (f)
www.ndaa.org

Written Testimony for

Mr. Scott Burns, Esq.
Executive Director
National District Attorneys Association (NDAA)

for the

U.S. Senate Committee on the Judiciary
United States Senate

Hearing on

"Improving Forensic Science in the Criminal Justice System"

July 18, 2012

Chairman Leahy, Ranking Member Grassley, members of the Committee, thank you for inviting me to testify in this important hearing on behalf of the National District Attorneys Association (NDAA), the oldest and largest professional organization representing over 39,000 district attorneys, state's attorneys, attorneys general and county and city prosecutors with responsibility for prosecuting up to 95% of all criminal cases in the United States.

Since 2009, this Committee – and, more specifically, Chairman Leahy and Ranking Member Grassley – has worked hard to gather all stakeholders groups involved with forensic sciences to weigh in to help create comprehensive forensic science reform legislation. Given the history between the dozens of organizations on different sides of this issue, their efforts to get us all in the same room was a major accomplishment in itself.

In early 2011 when Senator Leahy first introduced S. 132, The Criminal Justice and Forensic Science Reform Act, NDAA had significant concerns with the bill – along with many other stakeholder groups on all sides of the issue. However, when the bill was first introduced, Senate

Judiciary staff intimated that they saw S.132 as a "starting point" where stakeholders could weigh in on what they agreed with and disagreed with in the bill in order to find common ground – including the need for uniform accreditation and certification standards, increased funding for research in forensic sciences and for any proposed Office of Forensic Science to be housed within the U.S. Department of Justice. We felt their approach to this massive undertaking was sound and we appreciate their willingness to work with all stakeholder groups in the formulation (and subsequent reformulation) of this important legislation.

Over the past several years, since the National Academy of Sciences released its study titled *Strengthening Forensic Science in the United States*, it has been reported that the law enforcement community – and, more specifically, State and local prosecutors – have worked to curtail reform efforts on forensic sciences. This could not be further from the truth. Prosecutors do not oppose providing greater support, financially and otherwise, to crime laboratories - especially in the case of public laboratories. Prosecutors also do not oppose research for purposes of validating existing or developing methods or techniques.

Prosecutors support such research efforts, as one might expect that we would, as any research that provides greater accuracy and reliability to the evidence we regularly present in courtrooms benefits our mission. It is, after all, the prosecutor who is charged, first and foremost, with the duty to seek justice. For that same reason, we also support research and development which increases laboratory capacity to generate accurate and reliable testing results and evidentiary analysis. The more evidence accurately and reliably analyzed the better armed prosecutors are to make accurate and reliable judgments in those cases submitted to us. In this way, we are better armed to attempt to bring justice to those victimized in our counties, cities, towns and neighborhoods, while protecting those who might otherwise be wrongly cast under suspicion.

State and local prosecutors also do not oppose research that will lead to increased laboratory capacity or that will improve accuracy, precision or reliability. Prosecutors want and need the best quality evidence and analysis possible to determine the innocence or guilt of the accused. The continued development and improvement of quality assurance and quality control protocols assist in insuring accuracy, precision and reliability within the laboratory. So do programs providing for the accreditation of laboratories and the certification of practitioners.

The commitment of the forensic science community for reliable science is evidenced by its investment in the accreditation process. Three organizations currently accredit forensic laboratories within the U.S.[1] Virtually all public laboratories are accredited today. ASCLD-LAB has accredited an estimated 380 such laboratories, federal, state, local, private and international. Most of those laboratories were accredited before 2009. The National Academy report recommended accreditation to a recognized international standard for accreditation (ISO 17025). Accrediting bodies in this country were in the process of accrediting laboratories to that standard before the Academy report was published. An estimated 180 labs are already accredited to that standard by ASCLD-LAB with the remainder in the process of becoming so accredited. It is our hope that any comprehensive forensic science legislation out of this body would utilize existing forms of accreditation instead of trying to "reinvent the wheel" by mandating a different standard.

It is NDAA's belief that non-DNA forensic science disciplines have been demonized in recent years because their reliability is not up to the "DNA Standard" seen on popular television shows like CSI. Unfortunately, real world examples of cases tried on television are few and far between. Some cases are fortunate enough to have something as reliable as DNA evidence, but most cases do not.

As stated on the Innocence Project's webpage (www.innocenceproject.org), since 1989 there have been 289 post-conviction DNA exonerations in the United States. While NDAA agrees that even one wrongful conviction of an innocent person is too many, this number needs to be taken into proper context to gain an accurate portrayal of the state of forensic science in America's criminal justice system.

---

[1] Forensic Quality Services, American Society of Crime Laboratory Directors-Laboratory Accreditation Board and A2LA.

In the United States there are, at minimum, 10 million cases per year (not including traffic offenses) where serious crimes have been committed; this means since 1989 there have been at least 220 million cases in America involving serious crimes. While 289 post-conviction exonerations are of real concern to NDAA, in reality those wrongful convictions constitute less than .0001 (one ten thousandth of one percent) of the convictions obtained in America's courtrooms. While no one from NDAA is naive enough to think that the Innocence Project has uncovered every single wrongful conviction in America, 99.9999% is a pretty good track record.

It is also important to note, misinformation and hyperbole aside, that the majority of wrongful convictions do not owe their existence to faulty forensic science but rather to bad lawyering on both sides of the courtroom, false confessions and misidentification. Recognizing that, NDAA has created a new committee, the Fair and Truthful Administration of Justice Committee, to educate all our members about our extraordinary ethical obligations, the phenomenon of false confessions and the frailties associated with eyewitness identification. In just a few days our summer conference will have lectures presented from nationally renowned experts in the fields of identification and ethics, and in the near future on the issue of false confessions. We will continue to educate our members on presenting the best forensic evidence available - evidence that both exonerates and convicts.

Many defense-oriented stakeholder groups and groups representing the wrongly convicted via the national media highlight these 289 post-conviction exonerations and come to the conclusion that America's criminal justice system and its use of forensic sciences in the courtroom is suspect and the system is irreparably broken. NDAA could not disagree more with this notion; it is important for us to remember that the vast majority of the time during criminal cases – again, more than 99.9999% of the time - the prosecutor properly serves justice and gets the case right. That said, NDAA fully supports this Committee's efforts on making improvements to forensic science and agrees that federal resources be used to improve the quality and reliability of forensics across all forensic science disciplines for the benefit of America's crime victims and the betterment of America's communities.

Chairman Leahy, Ranking Member Grassley, members of the Committee, thank you for asking me to testify today and thank you for all that you do for America's state and local prosecutors and victims of crime. I'm happy to answer any questions you may have.

Statement Of Senator Patrick Leahy,
Chairman, Senate Judiciary Committee,
On "Improving Forensic Science in the Criminal Justice System"
July 18, 2012

Today the Judiciary Committee considers, once again, the important issue of how best to ensure the effectiveness and scientific integrity of forensic evidence used in criminal cases, which is essential to making sure the criminal justice system works for all Americans. This is an issue that the Committee has prioritized for years. It was an issue that formed a backdrop for the Committee's work on the Innocence Protection Act and the Justice for All Act in the last decade and that we have focused on anew for the past three plus years.

The National Academy of Sciences published a report in February 2009 asserting that the field of forensic science has significant problems that urgently need to be addressed. I did not then and do not now view the Academy's report as the final word on this issue, but rather as a starting point for a searching review of the state of forensic science in this country.

In the past several years, we have seen a continuing stream of exonerations of people convicted of serious crimes, some because of mistakes of counsel, but also some, too many, because of flawed forensic evidence. Kirk Odom, imprisoned in Washington, D.C., for 20 years for a rape he did not commit based on faulty hair analysis, is just one recent, tragic example. Just last week, the Justice Department announced a sweeping review of thousands of cases to determine whether defendants were wrongly convicted based on flawed forensic evidence by the FBI lab in the 80's and 90's. [*hold up Washington Post*] It has long been clear that action is necessary to ensure improved support for forensic science and meaningful national standards and oversight.

The Judiciary Committee's process began even before the National Academy of Sciences report. The Committee held two hearings in 2009 and has conducted numerous meetings over the years with those on all sides of the issue, including law enforcement, prosecutors, defense attorneys, forensic scientists, academic scientists, and many, many others. In 2011, I introduced the Criminal Justice and Forensic Science Reform Act; comprehensive legislation designed to build greater certainty and reliability into forensic science nationwide. My outreach has continued after the introduction of the legislation. I have solicited feedback from all sides and continue to work to find the best consensus solution.

One thing that has become very clear through this intensive process is that, for all the serious problems that have been found and questions that have been raised, forensic practitioners are doing great work every day. Laboratories and practitioners around the country follow sound procedures, strive to be as fair and accurate as possible, and produce vital evidence used successfully in courtrooms on a daily basis. It is important to recognize the good work that is happening as well as the significant gaps. We need a solution that builds on existing strengths, identifies weaknesses, and finds ways to fill those gaps.

Strengthening forensic science is not something that tips the scale to one side or the other in the justice system. Forensic disciplines that have been proven to be reliable and that engender total confidence will help law enforcement and prosecutors to identify and convict those guilty of serious crimes. Currently, doubts about the reliability of some forensic analysis have led to successful challenges in court. More research and tighter standards will ensure that good evidence is accepted as a matter of course. Strong research, standards, and oversight will also help to ensure that forensic evidence is never misused to convict innocent people. Increased public confidence in the criminal justice system will follow.

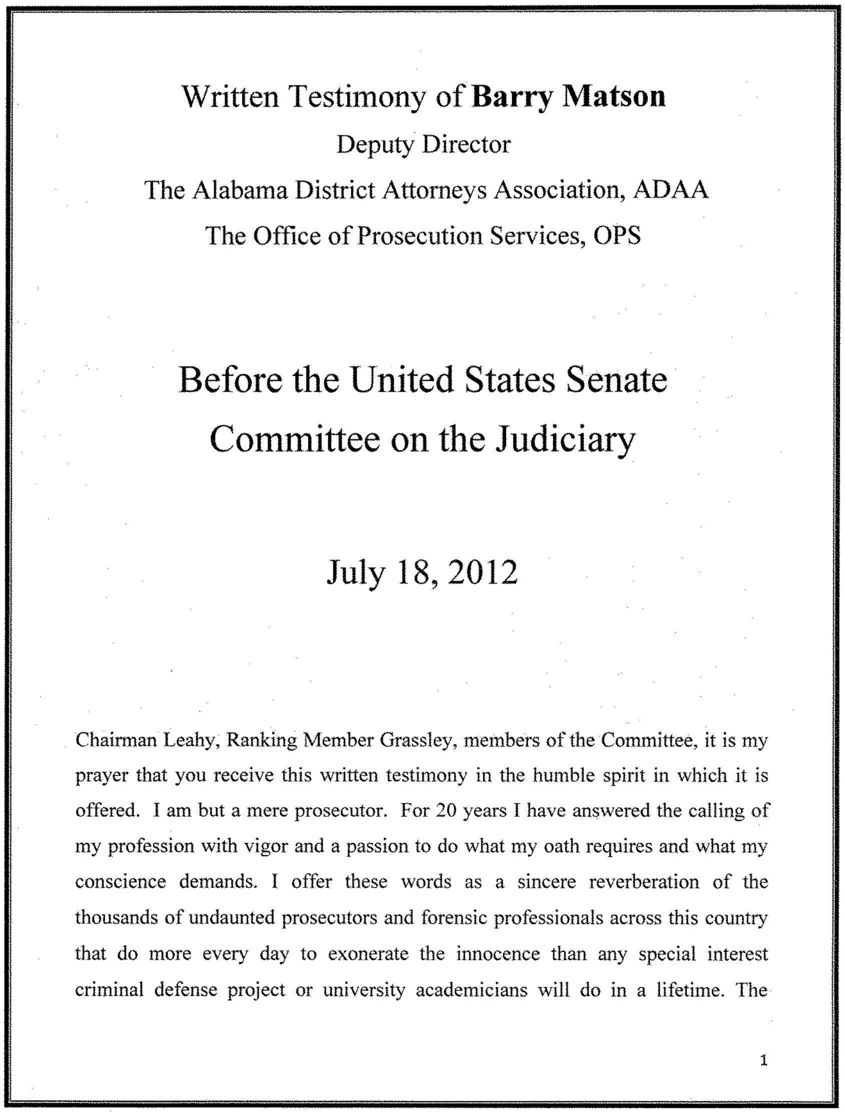
It is because strengthened forensic science benefits all sides of the criminal justice system that we have been able to find so many points of consensus and engage in a positive process with so many from so many different points of view. Today we will hear from a police lab commander, a state lab director, a prosecutor, and a founder of the Innocence Project. They will not agree on all of the details of how best to move forward, but I believe they will agree that action is necessary and, more to the point, will agree on many of the principles that should guide a legislative solution.

There is widespread acknowledgement that every forensic laboratory nationwide should be accredited under recognized national standards and that every forensic practitioner should be certified in his or her field based on appropriate training, education, and ability. Further, there is agreement that we must dedicate resources to basic foundational research into the validity of forensic disciplines and the methods they employ, and that we must agree on basic standards. We must incorporate existing structures and standards that are working, but add oversight and review to make sure that key gaps are filled. Finally, there is a shared understanding that the forensic science community needs federal support for capacity building, training, and development of new technologies.

We all recognize the importance of harnessing the expertise of those within the criminal justice system to identify what the needs are and how forensic science is applied every day. The Justice Department is best positioned to play this central role. We also recognize that scientific judgments must be made by independent scientists. Agencies like the National Institute of Standards and Technology and the National Science Foundation can help bring scientific independence.

I have tried to incorporate these principles into the Criminal Justice and Forensic Science Reform Act and have appreciated discussing with so many how to make this legislation even better. I hope that by working together we will be able to improve this vital legislation and move forward so that we can more effectively ensure that the criminal justice system works as it should, and has the confidence of the American people.

# # # # #



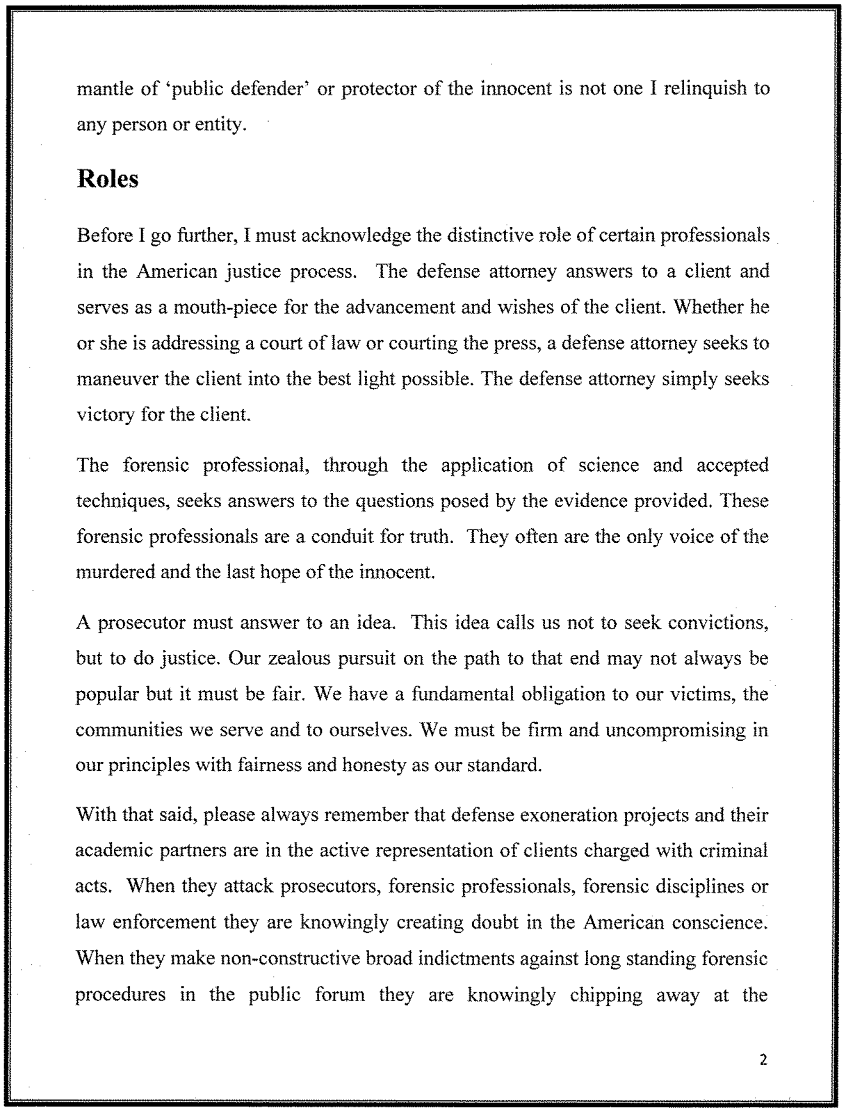
Written Testimony of **Barry Matson**

Deputy Director
The Alabama District Attorneys Association, ADAA
The Office of Prosecution Services, OPS

Before the United States Senate Committee on the Judiciary

July 18, 2012

Chairman Leahy, Ranking Member Grassley, members of the Committee, it is my prayer that you receive this written testimony in the humble spirit in which it is offered. I am but a mere prosecutor. For 20 years I have answered the calling of my profession with vigor and a passion to do what my oath requires and what my conscience demands. I offer these words as a sincere reverberation of the thousands of undaunted prosecutors and forensic professionals across this country that do more every day to exonerate the innocence than any special interest criminal defense project or university academicians will do in a lifetime. The



mantle of 'public defender' or protector of the innocent is not one I relinquish to any person or entity.

Roles

Before I go further, I must acknowledge the distinctive role of certain professionals in the American justice process. The defense attorney answers to a client and serves as a mouth-piece for the advancement and wishes of the client. Whether he or she is addressing a court of law or courting the press, a defense attorney seeks to maneuver the client into the best light possible. The defense attorney simply seeks victory for the client.

The forensic professional, through the application of science and accepted techniques, seeks answers to the questions posed by the evidence provided. These forensic professionals are a conduit for truth. They often are the only voice of the murdered and the last hope of the innocent.

A prosecutor must answer to an idea. This idea calls us not to seek convictions, but to do justice. Our zealous pursuit on the path to that end may not always be popular but it must be fair. We have a fundamental obligation to our victims, the communities we serve and to ourselves. We must be firm and uncompromising in our principles with fairness and honesty as our standard.

With that said, please always remember that defense exoneration projects and their academic partners are in the active representation of clients charged with criminal acts. When they attack prosecutors, forensic professionals, forensic disciplines or law enforcement they are knowingly creating doubt in the American conscience. When they make non-constructive broad indictments against long standing forensic procedures in the public forum they are knowingly chipping away at the confidence of the American venire. Because of this strategy and the National Academy of Science Report on **Strengthening Forensic Science in the United States: A Path Forward,** we are facing such an assault every day.

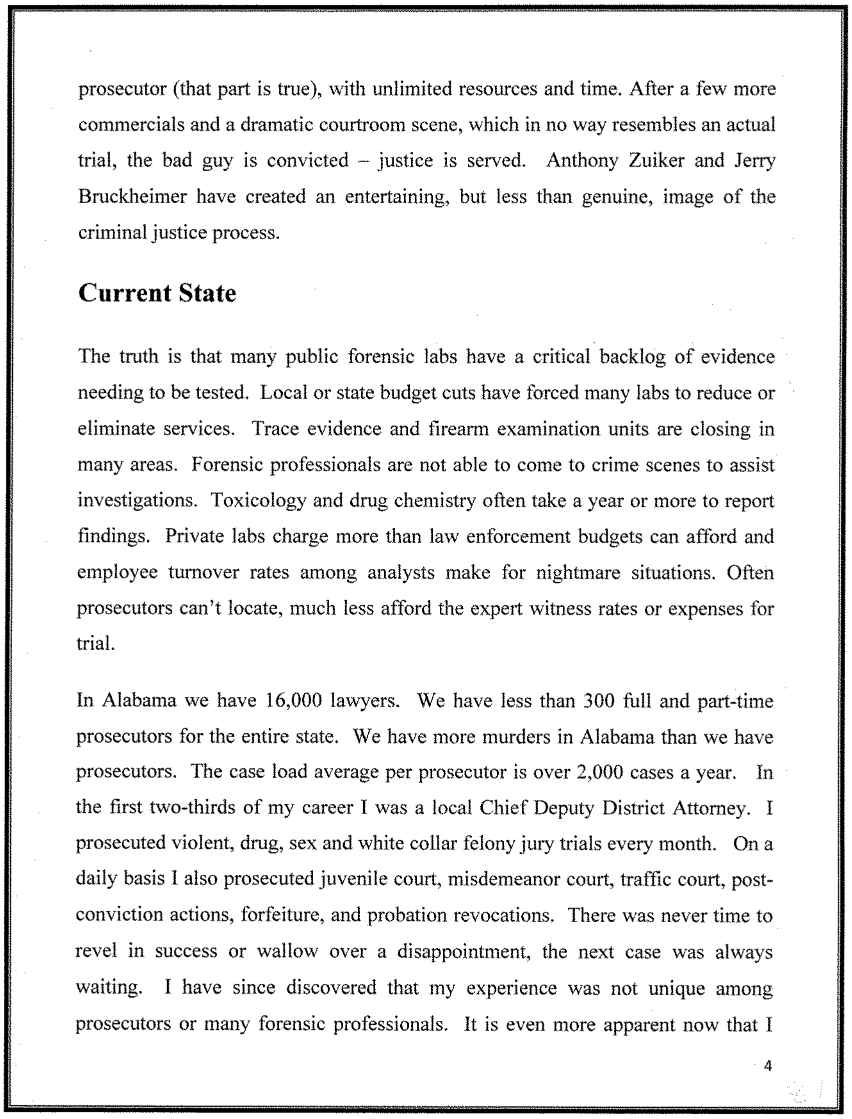
History

I am compelled to remind you that a large number of the wrongful convictions touted by certain criminal defense projects occurred before the advent of modern DNA procedures. Now we have the capability of testing all physical evidence recovered relative to a crime scene for biological evidence. From a rape kit to a tossed cigarette, if a sufficient amount of biological debris is present a forensic professional can extract the unidentified DNA 'fingerprint' from the evidence. That DNA 'fingerprint' can be compared with the known DNA samples of particular suspects. Based on the results, the person will be determined to be the source of the unknown DNA evidence or the person will be excluded as the source of the DNA evidence.

It is further important to note that these same exoneration projects and academicians fought against the acceptance of DNA evidence into the American criminal justice system. It was prosecutors and forensic professionals all across this country that aggressively sought for the acceptance of DNA testing in criminal cases.

Image

The entertainment industry paints a picture of forensic fashion model. These dashing thespians pull up to a crime scene in $80,000 sports cars where they process the crime scene in a matter of minutes and have drive-through DNA and ballistics by lunch. After the commercial, the case is passed off to a handsome



prosecutor (that part is true), with unlimited resources and time. After a few more commercials and a dramatic courtroom scene, which in no way resembles an actual trial, the bad guy is convicted – justice is served. Anthony Zuiker and Jerry Bruckheimer have created an entertaining, but less than genuine, image of the criminal justice process.

Current State

The truth is that many public forensic labs have a critical backlog of evidence needing to be tested. Local or state budget cuts have forced many labs to reduce or eliminate services. Trace evidence and firearm examination units are closing in many areas. Forensic professionals are not able to come to crime scenes to assist investigations. Toxicology and drug chemistry often take a year or more to report findings. Private labs charge more than law enforcement budgets can afford and employee turnover rates among analysts make for nightmare situations. Often prosecutors can't locate, much less afford the expert witness rates or expenses for trial.

In Alabama we have 16,000 lawyers. We have less than 300 full and part-time prosecutors for the entire state. We have more murders in Alabama than we have prosecutors. The case load average per prosecutor is over 2,000 cases a year. In the first two-thirds of my career I was a local Chief Deputy District Attorney. I prosecuted violent, drug, sex and white collar felony jury trials every month. On a daily basis I also prosecuted juvenile court, misdemeanor court, traffic court, post-conviction actions, forfeiture, and probation revocations. There was never time to revel in success or wallow over a disappointment, the next case was always waiting. I have since discovered that my experience was not unique among prosecutors or many forensic professionals. It is even more apparent now that I prosecute cases from all around the state and lecture and train prosecutors and law enforcement nationally. Anecdotally the evidence of such conditions are apparent everywhere.

The public has grown to demand fast answers to complex investigative processes. These demands have added new expectations on the investigation and prosecution of criminal cases. The lack of resources and these new demands will not be corrected by new levels of bureaucracy.

Need

We applaud Chairman Leahy and his staff's monumental efforts to address deficiencies in the criminal justice system, specifically as they relate to forensic sciences. Chairman Leahy, Ranking Member Grassley and the entire Committee have the respect and admiration of those of us who labor every day in the criminal justice system.

The forensic community needs additional research to further validate the subjective disciplines of forensic science. What the forensic science community does not need is criticism of the science as "faulty" before any of the research is conducted and evaluated objectively. After all, the same entities that criticize them now, also champion them if they provide the answer they desire. Any and all research needs to be conducted from the design stage to evaluating the downstream results with real world forensic practitioners involved throughout. This would ensure the results are interpreted correctly. The research should be conducted collaboratively as it leverages the strength of the academic and real world parties.

We must have a forensic science system that is responsive and adaptable. Our forensic laboratories must be able to not only process all the evidence they receive, but they must have a capacity to do so in a timely manner. Every forensic discipline must have the tractability to recognize and answer evidentiary trends, such as we are currently experiencing with synthetic controlled substances.

We support existing forms of accreditation for all public forensic laboratories in accordance with all appropriate and accepted standards. They must have realistic standards which are relevant and appropriate for each forensic discipline. Obviously we recognize that no amount of testing or accreditation will ever completely remove all possibility of error. However, we strongly support proficiency testing for each forensic discipline.

The capabilities of forensic laboratories and their capacity to provide reliable and accurate examination of evidence, is critical to the criminal justice system's ability to bring the guilty to justice and protect the innocent.

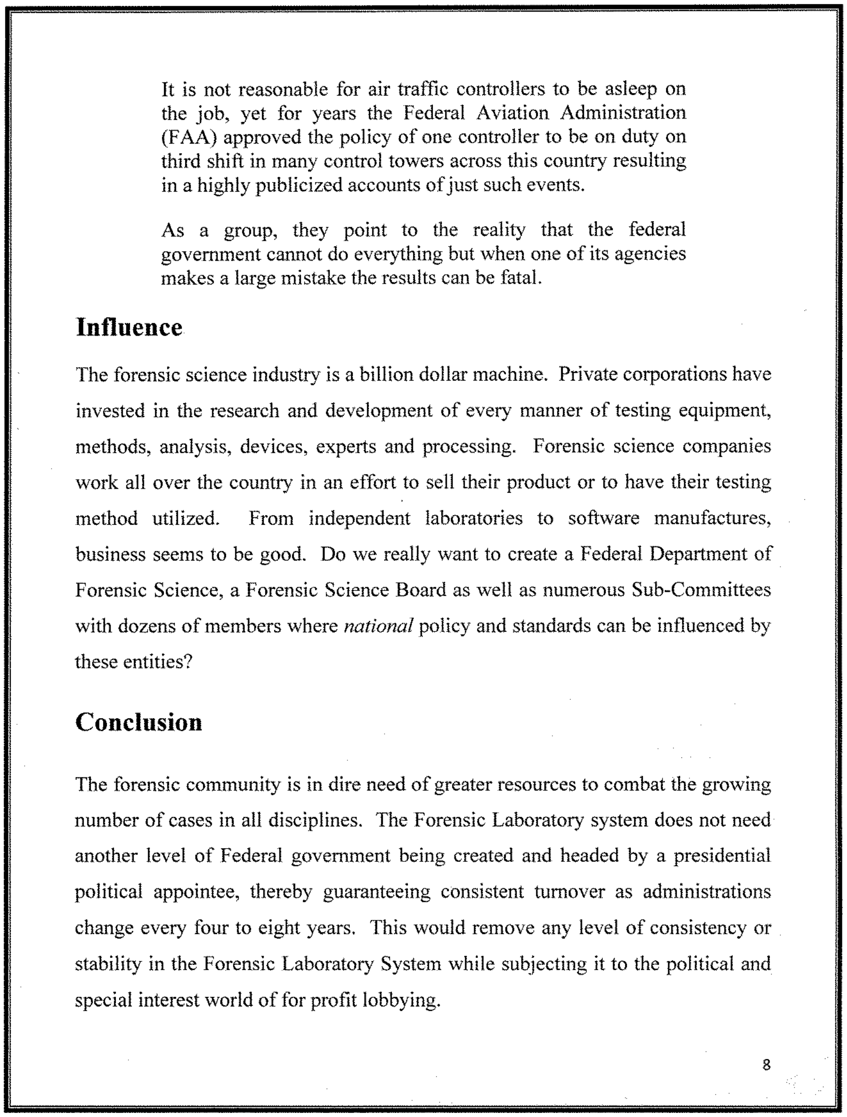
Dissent

With regard to the **Criminal Justice and Forensic Science Reform Act of 2011**, which seeks to establish an Office of Forensic Science and a Forensic Science Board, we support the goal of ensuring consistency and scientific validity in forensic testing. However, we respectfully do not support the creation of a new political Federal Forensic entity. We are particularly concerned with relinquishing to a political appointee the responsibility of establishing and implementing national forensic science policy as it relates to the criminal justice system. We are not comforted by the addition of a Forensic Science Board which would merely serve as an advisory board to the Director, who would maintain the ability to reject or modify recommendations. This Director of Forensic Sciences would also have the ability to decide what forensic science disciplines warrant the creation of a subcommittee, thereby determining validity.

In my career I have worked with many hard working and dedicated federal public servants. They often have a mountain of responsibilities and shoulder heavy burdens; failure is not an option. I have also had very impressive experiences with forensic science professionals within federal law enforcement. However, I am reluctant to take forensic science as it exists on the state and local level and create a new federal bureaucracy to answer the current needs.

Just because we turn over a responsibility to the federal government by creating a new federal regulatory entity within the Department of Justice, does not mean it will succeed. Is the federal model the best example when our goal is to strengthen forensic sciences and remove rates of error? Some recent illustrations:

> The Food and Drug Administration, (FDA) admitted they should have taken stronger action to stop a firm from making and distributing medical products potentially tainted with life-threatening bacteria. The contaminated products have been blamed in lawsuits for serious infections and the death of a 2-year-old child.
>
> The FDA admitted it made a mistake in approving a knee implant against the advice of its scientific reviewers. The agency admitted its decision to approve the implant was influenced by outside pressure.
>
> One of the most important missions of the U.S. Securities and Exchange Commission, (SEC) is to protect investors. The SEC somehow missed the biggest Ponzi scheme in history. In the Madoff scandal, investors had their lives destroyed as they lost billions of dollars and our nation lost trust in the investment securities process.



> It is not reasonable for air traffic controllers to be asleep on the job, yet for years the Federal Aviation Administration (FAA) approved the policy of one controller to be on duty on third shift in many control towers across this country resulting in a highly publicized accounts of just such events.
>
> As a group, they point to the reality that the federal government cannot do everything but when one of its agencies makes a large mistake the results can be fatal.

Influence

The forensic science industry is a billion dollar machine. Private corporations have invested in the research and development of every manner of testing equipment, methods, analysis, devices, experts and processing. Forensic science companies work all over the country in an effort to sell their product or to have their testing method utilized. From independent laboratories to software manufactures, business seems to be good. Do we really want to create a Federal Department of Forensic Science, a Forensic Science Board as well as numerous Sub-Committees with dozens of members where *national* policy and standards can be influenced by these entities?

Conclusion

The forensic community is in dire need of greater resources to combat the growing number of cases in all disciplines. The Forensic Laboratory system does not need another level of Federal government being created and headed by a presidential political appointee, thereby guaranteeing consistent turnover as administrations change every four to eight years. This would remove any level of consistency or stability in the Forensic Laboratory System while subjecting it to the political and special interest world of for profit lobbying.

Chairman Leahy, Ranking Member Grassley, members of the Committee, I must respectfully thank you for accepting this written testimony. It is a testament to your character and statesmanship that you will accept a dissenting opinion in the spirit in which it is offered. We clearly all seek the same thing: a fair and honest criminal justice system that makes our communities safer and keeps our citizens protected from the criminal element, but not at the expense of unreliable evidence or an ineffective criminal justice system.

INNOCENCE PROJECT

TESTIMONY OF PETER NEUFELD
CO-DIRECTOR, THE INNOCENCE PROJECT
SENATE JUDICIARY COMMITTEE HEARING
"IMPROVING FORENSIC SCIENCE IN THE CRIMINAL JUSTICE SYSTEM"
JULY 18, 2012

Thank you Chairman Leahy, Ranking Member Grassley, and members of the Committee, for the opportunity to testify once again to discuss how our collective efforts can support the scientific needs of the forensic science community. My name is Peter Neufeld and I am the co-director of the Innocence Project, affiliated with the Cardozo School of Law, which co-director Barry C. Scheck and I founded in 1992. The project, which celebrated its 20 year anniversary this year, is a national litigation and public policy organization dedicated to exonerating wrongfully convicted people through DNA testing and reforming the criminal justice system to prevent future miscarriages of justice.

The development of DNA testing has allowed the Innocence Project to help exonerate 293 factually innocent Americans – 17 of whom were on death row awaiting execution. It is important to note, however, that DNA testing is probative of innocence or guilt in less than 10% of all felonies. Other forms of forensic evidence may be probative in a large percentage of those other cases. Thus the need to be as sure as possible about the probative value of non-DNA forensic evidence is critical to the integrity of our criminal justice system.

This is particularly true given the fact that DNA exonerations have demonstrated the importance of improving non-DNA forensics. These cases have provided an opportunity to retrospectively examine what went wrong, causing the system to find innocent people guilty beyond a reasonable doubt of crimes they did not commit. That research has yielded an important statistic: unvalidated and/or improper forensic evidence was the second-greatest contributing factor to those erroneous convictions.[1] Those cases show what the National Academy of Science report, *Strengthening Forensic Science: A Path Forward,* documents – that the insufficient scientific foundations of non-DNA forensic evidence have tremendous potential to mislead the criminal justice system away from the real perpetrators of crime, and that the system must use peer-reviewed science to address these scientific shortcomings in order to improve the reliability of forensic evidence. If the nation does this, we will increase the accuracy of criminal investigations, the strength of prosecutions, and the integrity of convictions.

In Washington, DC in 1981, a 27-year-old woman was brutally raped, sodomized, and robbed in her Capitol Hill apartment.[2] The victim observed her attacker for about two minutes in the dim light of the street lamps through her window before she was blindfolded. A police officer speaking to Kirk Odom, who was 18 years old at the time, on an unrelated matter five weeks after the assault thought he looked like the composite sketch of the attacker and put a photograph of a 16-year-old Odom in a photo array for the victim. Odom was identified by the victim from the photo array. At trial, the identification was supported by an FBI agent's testimony that a hair from the victim's nightgown was "microscopically like" Odom's, and the government's brief summarizing the agent's testimony stated, "This was significant because it was a very rare phenomenon; only eight or ten times in the past ten years, while performing thousands of analyses, had [the FBI agent] reported that he could not distinguish even microscopically between two or three known samples."[3] After a few hours of jury deliberation, at the young age of 18 years, Kirk Odom was convicted for a crime he did not commit.[4]

---

[1] "Unreliable or Improper Forensic Science." The Innocence Project, available at http://www.innocenceproject.org/understand/Unreliable-Limited-Science.php.

[2] Hsu, Spencer S., "Kirk Odom, who served 20 years for 1981 D.C. rape, is innocent, prosecutors say," Washington Post [Washington, D.C.] 10 July 2012, available at http://www.washingtonpost.com/local/crime/kirk-odom-who-served-20-years-for-1981-dc-rape-is-innocent-prosecutors-say/2012/07/10/gJQAUjZNbW_story.html?wp_login_redirect=0 (last accessed, 7/14/2012).

[3] United States v. Kirk L. Odom, Gov't Brief at 7.

[4] Johnson, Carrie, "Justice Delayed: After Three Decades, An Apology." NPR.org, 10 July 2012, available at http://www.npr.org/2012/07/10/156547972/justice-delayed-after-three-decades-an-apology (last accessed, 7/14/2012)

Odom maintained his innocence and his hopes were buoyed after hearing about the 2009 exoneration of Donald Gates, a D.C. area man whose conviction was also based in part on the same type of forensic evidence.[5,6] In 2011, mitochondrial DNA testing showed that the hair fragment found on the victim's nightgown could not be Odom's and DNA testing of stains from a pillowcase and robe at the scene of the crime indicated that another man committed the crime.[7,8]

Kirk Odom is actually innocent of the crime for which he was forced to serve 22 years in prison as a sex offender, 9 years on parole, and register as a sex offender for the rest of his life. Yet he is a luckier man than most other wrongfully convicted people, because post-conviction DNA testing finally enabled him to prove his innocence. He was officially exonerated last Friday, July 13th, on his 50th birthday.[9]

We are all lucky, too, because the criminal justice system can learn from this error. The lesson of Kirk Odom's case is not that we should point fingers at forensic science or forensic scientists; forensic scientists have been doing the best they can with the scant resources and insufficient scientific foundation they have had at their disposal. In fact, the FBI agent in Odom's case, when interviewed, stated, that microscopic hair comparison "was the best method we had at the time."[10] The lesson we must learn from such cases is that if we improve the scientific underpinnings of forensic practice, we can improve the forensic results that we rely on from forensic practitioners.

Forensic practitioners clearly want to use the best scientific techniques available to them to deliver analyses that are as solid and objective as possible – regardless of whether the

---

[5] Ibid.
[6] See note 2.
[7] Ibid.
[8] Hsu, Spencer S., "Kirk L. Odom officially exonerated; DNA retesting cleared him in D.C. rape, robbery." Washington Post [Washington, D.C.] 13 July 2012, available at http://www.washingtonpost.com/local/crime/kirk-l-odom-officially-exonerated-dna-retesting-cleared-him-in-dc-rape-robbery/2012/07/13/gJQAuH3piW_story.html (last accessed, 7/14/2012).
[9] Ibid.
[10] Hsu, Spencer S., "Convicted defendants left uninformed of forensic flaws found by Justice Dept." Washington Post [Washington, D.C.] 16 April 2012, available at http://www.washingtonpost.com/local/crime/convicted-defendants-left-uninformed-of-forensic-flaws-found-by-justice-dept/2012/04/16/gIQAWTcgMT_story_1.html (last accessed, 7/14/2012).

science favors the defendant, supports the prosecution, or is inconclusive. In the vast majority of cases where forensic evidence misleads the system, it is the underlying science that is inadequate. In some cases, forensic analysts make mistakes that result from a lack of scientific training or leadership. In still other cases, forensic analysts' testimony goes further than the science allows because the techniques that have been practiced for years have not been subjected to the rigors of scientific research - and thus the probative value of a given technique has never been established in a way that properly guides such testimony. Because of scientific shortcomings, the actual probative value of the forensic evidence is not always clear, and often misunderstood. This has a propensity to mislead everyone – analysts, investigators, prosecutors, defense lawyers, judges and juries, even the public – with regard to how much they should rely on the stated results of any given non-DNA forensic analysis.

The broad group of stakeholders and scientists who wrote the NAS report *unanimously* concluded that nothing short of independent scientific research and standard setting would be sufficient to overcome the fundamental weaknesses of forensic evidence. It is important to note that while the NAS report recognizes that the shortcomings in forensic education, training, certification, and standards for testing and testifying contribute to wrongful convictions and threaten the integrity of forensic results,[11] no amount of training and certification, and no robust accreditation scheme without such scientific research and standard setting would validate the forensic practices that the NAS report called into question.

That is why the Innocence Project has maintained throughout this process that independent scientific research and standard-setting must be at the heart of forensic science reform. Science – understanding the relative accuracy and reliability of a forensic technique – is not a matter of opinion. We cannot disregard the uncertainty that the NAS report identified so clearly simply because we've been collectively laboring under false assumptions for dozens of years. What we need now is to work toward the accurate forensic evidence base that only science can provide, and that all criminal justice stakeholders obviously want and need. Now is the time to provide our justice system with those answers. We must not shy away from embracing the depth of scientific improvement necessary to enable the most reliable forensic evidence possible. Doing anything less would provide us all with only the illusion of the justice and safety we rightly expect from our criminal justice system.

---

[11] Strengthening Forensic Science in the United States: A Path Forward, Committee on Identifying the Needs of the Forensic Science Community, The National Academies Press (2009), p 6. (hereinafter, *NAS Report).*

The Innocence Project, like many others who have participated in the process led by Senator Leahy over the past several years, strongly believes that the NAS report provided a critical wakeup call regarding the elemental scientific shortcomings that must be addressed in forensic science, and that it provided a roadmap to addressing the major improvements in the forensic system. While the findings of this expert scientific panel sounded an alarm about the criminal justice system's forensic practices, we must recognize that it provides Congress with a tremendous opportunity to provide for the needed improvements and support for this critically important field. Following the report's recommendations will allow us to increase the accuracy of criminal investigations; strengthen criminal prosecutions; bring justice to victims; conserve resources so law enforcement can dedicate them toward finding the true perpetrators of crime; and protect the innocent from wrongful conviction.

The Innocence Project applauds Chairman Leahy for the leadership he has shown by bringing a large group of stakeholders together to consider the path forward. We have been honored to play a part in that process since the beginning, and we are committed to continuing to work with you and your excellent staff to enact legislation that ensures that forensics enjoys a strong scientific underpinning and that improvements that are needed are incorporated as seamlessly as possible. It is only by working together, guided by science, that will we see that true reform occurs.

We are committed to working with the Senate Judiciary Committee and the many Members of Congress who are committed to forensic science reform on making use of existing resources in relevant agencies of the U.S. government to support a national forensic science agenda in its areas of expertise. We continue to believe that, to the extent possible, the National Science Foundation (NSF) and the National Institute of Standards and Technology (NIST), the government's world-renowned and highly respected science agencies, would serve as the most appropriate home for the rigorous scientific research and basic and applied standard setting that need to be conducted—again, with feedback of practitioners. And we continue to believe that the Department of Justice (DOJ) should put that work into practice by using its expertise in oversight and enforcement.

In any reform endeavor, we believe there should be a strong relationship between the independent scientists charged with undertaking the research and standard-setting functions and the expert practitioners and other criminal justice stakeholders who use these techniques each day. It is those users who will abide by those standards, so it is essential they be able to adopt and follow them. We also believe that for the endeavor to succeed, it is important that the new standards be phased-in to the diverse set of crime laboratories across the country without causing a significant disruption to the criminal justice system. Therefore, we believe that practitioners and affected stakeholders have a critical role to play in advising and providing feedback to the scientific research and standard setting process. Advice and feedback should also be divined from the vast experience accumulated through the apprenticeship model of learning among forensic practitioners, which holds great value.

Research scientists, who have a background in physics, biology, chemistry, statistics, cognitive science, engineering, and other sciences, from academic institutions or in science based agencies of the Federal government rather than in law enforcement agencies, have the training to scrutinize and improve the current body of research. The absence of an independent research infrastructure, upon which medicine, industry, and technology can rely, has prevented the full development of the field of forensic science and stymied the discovery of new technologies for law enforcement. Despite extensive and specialized forensic knowledge, forensic examiners do not have the specific research knowledge essential to develop empirical studies that will withstand criticism and create a comprehensive framework for forensic science reform. Forensic science is a multi-disciplinary field and the engagement, input, and leadership of the scientists, engineers, and statisticians are critically needed for reform to work and to restore confidence in the accuracy and reliability of forensics.

It is time to establish an ongoing and permanent scientific system of support for forensic science in order to ensure ongoing evaluation and review of current and developing forensic science techniques, technologies, assays, and devices; and continued government leadership, both publicly and through private industry, in the research and development of improved technology with an eye toward future economic investments that benefit the public good and the administration of justice. And it is time for the resulting scientific body of knowledge to be translated into rigorous but practical standards by which crime laboratories across the country – large and small, urban and rural – can implement with the support and oversight of our federal law enforcement agency. This joint mission of science and law enforcement can only be accomplished with all stakeholders working together, sharing their expertise to make forensic science as valid, reliable, and employable as possible in order to best administer justice.

The additional benefit of doing such work is that the impact of such rigorous scientific research will be enormous. There is a global market for technologies with an application to public safety and the United States has the capacity to capture that market with a national commitment today. As the forensic market expands to meet this global need, more jobs will be created as scientists are engaged in research and more Americans are trained to conduct forensic analyses under American developed protocols and standards. However, as the United States begins to make greater investments in forensic technologies, it is even more important that the underlying science of the forensic techniques used in these technologies are understood and developing technologies scrutinized before they are implemented so that we do not find ourselves in the same position in the future.

Science can light the way to the path forward and it is upon the shoulders of justice that we can progress down that road. Together, we must make every effort to support the collaboration of these two communities, with each one teaching and learning from the other. Post-conviction DNA exonerations have shown the catastrophic consequences of such a lack of partnership between science and the law – not only are innocent individuals incarcerated, but when the system is focused on an innocent suspect, the real perpetrator remains free to commit other crimes, just like the real perpetrator of the crimes for which Kirk Odom was wrongfully convicted.[12] With your support, we will not only significantly enhance the quality of justice in the United States, but we will also minimize the possibility that tragedies like that endured by the nation's 293 (and counting) exonerees and their families will needlessly be repeated time and again.

---

[12] In the wake the 293 DNA exonerations of the wrongfully convicted, that same DNA analysis has enabled the identification of 142 true suspects and/or perpetrators of those crimes. About 40% of the DNA exoneration cases where the real perpetrators have been identified, these offenders were convicted of other violent crimes subsequent to the crimes for which innocent people were convicted. Over 100 violent crimes might have been prevented if the state had caught he real perpetrator of the exoneration crime originally. Many cases could not be prosecuted due to the statute of limitations, etc.

Testimony of Jill Spriggs
Consortium of Forensic Science Organizations
President, American Society of Crime Lab Directors
Crime Lab Director, State of California

before the
United States Senate Committee on the Judiciary

July 18, 2012

Mr. Chairman and Members of the Committee:

Thank you for giving me the opportunity to testify before you today about the status of forensic advancement and the legislation on which your Committee has been working.

I am Jill Spriggs, the Crime Lab Director for the State of California and the President of the American Society of Crime Lab Directors. However, I am here today representing the Consortium of Forensic Science Organizations and speaking on behalf of the over 12,000 forensic service providers that our ~~organizations~~ represent.

I would first like to express our appreciation for tackling the daunting task of writing this legislation, which is very important to our community, as well as for the process you have created in drafting this legislation. You and your staff have been most extraordinarily open and collaborative. It has been a process that we have greatly appreciated. We have been impressed by your office's desire to listen and learn from the actual practitioners in the complex field of forensic science. You and your staff have truly understood that the application of the science is quite different from what may be written in a textbook or on TV. We look forward to a continued productive dialogue.

As you know, it was the forensic community that asked for legislation many years ago with which to assess the needs and requirements of forensic science. That request resulted in the National Academy of Sciences study. We have long since recognized that, while our nation's crime laboratories and medical examiner offices are State and Local entities, our science has no borders and it crosses over into numerous jurisdictions. As such, continuity of processes is important. In 1994, Congress passed the DNA Identification Act to provide federal guidance to standards that would allow for the advancement and expanded use of DNA technology in order to utilize this groundbreaking technology in the most productive manner to the nation's Criminal Justice system. The federal government then took the leadership role in creating technical working groups consisting of federal, state and local forensic scientists, international members, academia and independent consultants. One of the most visible groups is the Scientific Working Group on DNA Analysis Methods or SWGDAM. The role of this group is to ensure the uniformity of DNA standards and improve processes within the forensic human DNA laboratory community.

Each discipline in forensic science also has a similar SWG group. For example, the Scientific Working Group for Seized Drugs or SWGDRUG and Scientific Working Group for Friction Ridge Analysis, Study and Technology or SWGFAST. (All SWG groups have the same interest at heart, which is to create a forum for increased quality in the discipline they represent. However, these other disciplines within the field of forensic science have not enjoyed such robust and widespread federal support as the DNA analysis Scientific Working Group. Areas such as, toxicology, controlled substances, latent print analysis, and firearms identification among others, comprise over 90% of the work conducted in our nation's laboratory system yet their scientific working groups are typically not funded and lack the prominence as the DNA analysis scientific working group. The nation's crime laboratory and medical examiner systems need to be viewed and addressed not as a single discipline but as a single system that encompasses all disciplines.

At the core of our issue is the ability of the system to be flexible and responsive. Our nation's crime laboratories must have the capacity to process all the evidence that comes into the laboratories in a timely manner and with the utmost in quality and accuracy. This applies to all disciplines of which there are approximately 13. In fact, while DNA is the most popular in the media, our largest backlog and casework is in fact, controlled substances. Many of our crime laboratories are drowning in synthetic drug cases. This is a perfect example of why we need federal guidance and leadership. All laboratories and state legislatures are experiencing similar issues with identifying drugs to schedule, then be able to place these substances into their respective codes, have the crime laboratories in a position to analyze them, only to have uncontrolled analogs to these drugs produced and distributed in a very efficient manner to circumvent new legislation.

Mr. Chairman, we are in support of the creation of an independent Office of Forensic Science within the Department of Justice and the continuation of the Scientific Working Groups to assist the Director in providing a national strategy and guidance. This has been a key to the success of our DNA program.

We support the accreditation for all public and private crime labs and believe they should operate in accordance with ISO/IEC 17025:2005 and other relevant ISO standards. These standards currently and should continue to apply to all testing laboratories and for the calibration of measuring and testing equipment. In fact, these international standards also apply to other non-forensic applications such as pharmaceutical testing, environmental sampling and testing, which impact all sectors of industry in the US. We agree that these standards should evolve and advance as the science does, and are encouraged by the discussions that we have had with your office regarding the continued utilization of these standards as we move forward versus starting over with federally established standards that may or may not be similar to these objective and internationally accepted standards.

Mr. Chairman, over 400 forensic laboratories are already accredited as well as over 65 Medical Examiner offices also accredited.

A natural progression from the quality systems of the organization, in other words accreditation, is the competency of the individual, or certification. While no program of certification or accreditation can guarantee error-free work, certification, at a minimum, attests that the individual performing the analysis has met a certain level of competence. Continuing proficiency testing is also an integral part of the certification process as well as a requirement in accreditation. We are supportive of an organized federal role in enhancing the breadth of proficiency testing, but again do not believe that the process should begin from scratch. Much like accreditation, it should be an on-going, evolving process that begins with what is already in place.

A National Research Strategy for comprehensive and targeted research of forensic science also must be pursued. It is critical, however, that there is input from the active practitioners in the field to ensure that the research is applicable to and necessary for the casework currently handled by crime laboratories and medical examiners. Further, any research should begin by assessing, locating, and amassing existing bodies of research from the numerous studies, which have already been conducted. This has been something our community has long asked for, however, funding for basic and applied research in forensics has been sparse at best and certainly not coordinated among the agencies that have provided researchers funding. In fact, we have recently learned that the Department of Defense is becoming more aggressive with research and we are concerned that this work should be adaptable and available for the forensic science community.

Key to the continued advancement of our science is a group of rigorous forensic science education programs both at the undergraduate and graduate levels. The well-established Forensic Education Program Accreditation Commission (FEPAC) has for some time been credentialing these programs; thereby ensuring only the highest quality opportunities are provided, again minimizing waste. It should be the barometer by which all educational programs are set for prospective forensic trainees. In addition, attention needs to be given to current in-service training programs to ensure continuity of standards and quality amongst the various programs administered throughout the nation.

I have spoken so far about issues that pertain mostly to the crime laboratories but another key element of forensic science is that of death investigation. As with operations in the crime laboratory the public has a right to competent medico-legal inquiries into every death. At present there is no national standard implemented for comprehensive medico-legal investigations, with roughly half the country utilizing a system of untrained or minimally trained lay coroners lacking requisite forensic training. The other half used highly trained and certified forensic pathologist physician functioning as medical examiners. At least four federal studies (NRC 1928, NRC 1932, IOM 2003, & NRC 2009) have all called for essential reform, yet to date, the status quo remains in effect with resultant shortcomings adversely impacting the justice system. We firmly believe that there needs to be education standards applied to death investigation.

Finally, grants for forensic science must include funding for accreditation, certification, and research, as well as capacity building in all disciplines. There must be the development of a process to determine the requirements of the community regarding grants (i.e. personnel, equipment, research, accreditation etc.). Such grants should be based on those requirements, not on politically driven agenda's. Specific, ongoing "needs" assessments should be conducted by the Department of Justice with a representative sampling of the forensic service provider community. Such studies would provide guidance to strategize grant distribution to maximize benefits while minimizing waste and redundancy.

Mr. Chairman and Members of the Committee there is much precedent in other countries for guidance and assistance for forensic science. An interesting model is the one in Australia and New Zealand whereby a National Institute of Forensic Science provides guidelines and coordination among the forensic science providers in those countries. In fact, it operates on a staff of 6 at the federal level. We are very supportive of a model similar to this. It is critical that we are able to provide the much needed leadership, guidance and experience to aid in the direction of a federal structure that ensures forensic science is at the forefront, as well as developing a quality system that enhances forensic science. Crime laboratories serve the public at large and the criminal justice system. In order to do this effectively, there must be an open line of communication between all parties in which quality forensic science comes first.

Again, thank you for all that you have done so far and we look forward to the continued discussion with you and your staff in order to achieve the much needed federal leadership that we require in the field of forensics.

INTERNATIONAL ASSOCIATION OF CHIEFS OF POLICE

TESTIMONY

Statement of

Commander Stephanie Stoiloff

Co-Chair, Forensic Science Committee
International Association of Chiefs of Police

Before the

Committee on the Judiciary

United States Senate

July 18, 2012

---

515 N. WASHINGTON STREET
ALEXANDRIA, VA 22314
703-836-6767
WWW.THEIACP.ORG

Good Morning Mr. Chairman and Members of the Committee,

My name is Stephanie Stoiloff and I serve as the Commander of the Forensic Services Bureau for the Miami-Dade Police Department in Miami, Florida. I also serve as the co-chair of the Forensic Science Committee of the International Association of Chiefs of Police (IACP), and I am here today on behalf of the IACP, representing over 22,000 law enforcement executives in over 100 countries throughout the world. In the United States there are over 18,000 state, local and tribal law enforcement agencies and over 800,000 state, local, and tribal law enforcement officers. I am pleased to be here this morning to discuss the challenges currently confronting the forensic science community within the United States and the need for further resources and support of forensic science within the law enforcement community.

In February 2009, the National Academy of Sciences (NAS) issued a report entitled, *Strengthening Forensic Science in the United States: A Path Forward.* In January 2011, legislation was proposed to address some of the topics discussed in this report. The IACP, the Major Cities Chiefs Association (MCCA) and the Association of State Criminal Investigative Agencies (ASCIA) each have Forensic Committees comprised of law enforcement executives, laboratory directors and private sector representatives from across the nation. The IACP Forensic Committee collaborated with the Forensic Committees from the MCCA and the ASCIA, as well as members of the National Sheriff's Association (NSA) to discuss some concerns with the proposed legislation. Collectively, we appreciate that Senator Leahy and his staff recognize that the collaborative efforts of all stakeholders are a critical component of this legislation. This collaboration has been a positive process that has enabled the concerns of the state and local agencies to be heard. Over the past thirty years, the forensic science community has voluntarily established internationally recognized laboratory accreditation and professional certification programs. Law enforcement agencies have made considerable financial investments to support this voluntary accreditation, a program defined by the implementation and maintenance of rigorous quality assurance standards, in over 400 crime laboratories nationwide. The importance of forensic science to the investigation of a crime has police chiefs nationwide asking how we can better use these forensic resources and, further, *how do we ensure scientific integrity*? Forensic science is not the floundering profession that some may portray it to be. As with any scientific discipline, there is a perpetual need for support, improvement, and advancement. In fact, many of the improvements in forensic science have resulted from the commitment of law enforcement agencies and their executive leadership to sound forensic practices. In the last two years, although many collaborations have been developed to address the recommendations brought forth in the NAS report, there are still several important concerns that need to be addressed.

The first—and greatest—need is funding: the forensic community needs funding to perform the work conducted nationwide every day. The common question asked is, “How much funding is needed?” $1 billion was allocated to address DNA backlogs. That is, $1 billion was allocated *for one discipline* that still is not able to completely manage the flood of evidence submitted for analysis. The analysis itself is expensive. Have we now put a price on public safety? How much funding can Congress allocate? $1 billion *per forensic discipline* would not be enough to address the need for accreditation, certification, research, education and analysis. The forensic community itself requested the NAS report to be written to address the resource needs of forensic service providers. We know what the problem is; the question is: "What is going to be done about it?"

The second need is leadership. The forensic community needs strong national leadership with the understanding that one size does not fit all. The needs of federal, state and local agencies are separate and distinct from each other. Our agencies and their forensic laboratories are at ground zero in the fight on crime. Most of these organizations have higher demands for service and fewer resources available with which to wage that fight as compared to the larger state and federal laboratories. Our agencies agree that all forensic service providers including stand-alone forensic units such as latent prints and crime scene units should follow quality standards and attain accreditation. Further, our agencies also agree that each forensic science discipline should have a competency/certification program and each forensic scientist must demonstrate competency in their discipline. The chief executives that the IACP, MCC and ASCIA represent have the ultimate responsibility to ensure accurate and efficient delivery of forensic services. Strong national leadership can provide a comprehensive plan to incrementally introduce and implement the funding and other resources necessary to fulfill these goals.

Third, there is a need for additional higher education programs in forensic science and the funding to support them. While forensic science has attracted nationwide attention, partially as the result of television portrayals of crime scene investigation, little funding has been funneled into higher education for forensic scientists. A common misperception is that forensic science is not a *science*. By definition, forensic science is the application of scientific knowledge and methodology to legal problems and criminal investigations. By its very nature, science is about new testing, new technology and new applications of technology: "How can we do what we do every day and do it better?" New advances occur every day within universities nationwide. More higher education programs and internships in forensic science should be established to assist the forensic science community. Forensic initiatives such as Pennsylvania State University, West Virginia University, the International Forensic Research Institute at the Florida International University, and the Marshall University Forensic Science Center are examples of successful higher education programs in forensic science. Forensic science research programs and educational opportunities support the investigations conducted daily by public safety agencies nationwide to protect its citizens and make communities safer.

In closing, federal, state, tribal and local law enforcement are utilizing every possible resource to provide public safety. The law enforcement community appreciates the opportunity to work with Senator Leahy and his staff to develop a workable solution that supports the needs of the forensic science community. These comprehensive discussions have covered all aspects of forensic science, including the incredible advances that have been realized in the recent past, the limitations of many historical procedures, opportunities for continued advancement, and the differences between theory, pop-fiction, and real forensic evidence. It is our hope that these open discussions will continue, allowing everyone to accomplish the goal of providing the framework and resources necessary to maintain our existing capabilities and develop new technologies for the future.

Thank you.

○